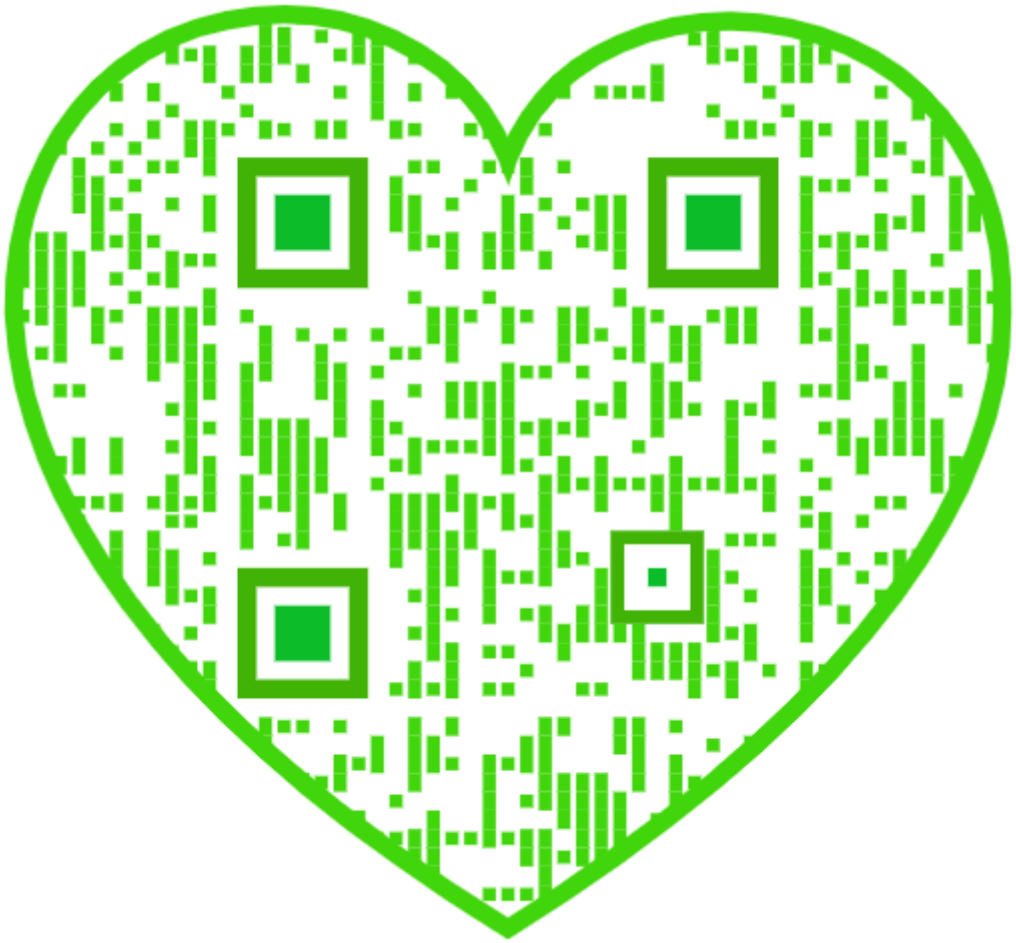


HISTORY OF CORN MILLING.

IN PREPARATION,

UNIFORM WITH THE PRESENT VOLUME,

BY THE SAME AUTHORS.

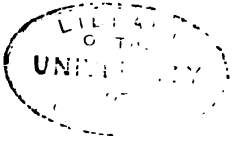
VOL. III.—FEUDAL LAWS AND CUSTOMS OF MILLS. — Compulsory Milling Soke: Its Origin and Incidence: Laws Relating to Ownership: Customs Affecting Millers: Status of Millers: Toll: Offences and Punishments: Pesage or Weighing Tax.

VOL. IV.—SOME FAMOUS FEUDAL MILLS.—King's Mills — Ardee, Dublin Castle, Dee Mills, Chester, Liverpool. Alienation of Kings' Mills. Monastic Mills—Shrewsbury. Rectorate Mills — Wigan. Civic Mills—London. Rights of Feudal Mills Extinguished by Ratepayers—Leeds, Bradford, Wakefield.

ALSO

THE LAWS, CUSTOMS AND ASSIZES OF BREAD BAKING.

THE WHOLE RICHLY ILLUSTRATED AND REPLETE WITH RECORDS FROM ORIGINAL SOURCES.



"THE MILLS OF BABYLON."—From Fifteenth Century MS.

See Page 76.

HISTORY OF CORN MILLING

VOL. II

WATERMILLS AND WINDMILLS

WITH NUMEROUS ILLUSTRATIONS

BY

RICHARD BENNETT AND JOHN ELTON

Edge Hill, Warwick.

LONDON
SIMPKIN, MARSHALL AND COMPANY LTD.

LIVERPOOL
EDWARD HOWELL, CHURCH ST.

1899

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PREFACE.

In Volume I. the varied forms of archaic handstones are seen to culminate in the Roman quern, from which were developed revolving mills driven by slave or cattle labour. In the present Volume the history is taken up from that point, and the development of the several forms of power corn mill traced from the classic ages to the advent of steam.

Such a record is not merely one of the manufacture of flour. The art of milling has been most slow of growth: evolving itself from absolute crudity to modern perfection but gradually, and as it were very leisurely, as the centuries passed away. But in tracing this apparently listless and lethargic evolution, we are brought face to face with affairs which not only largely account for it, but which in no slight degree are found to react upon the social life and industrial welfare of the people of all nations. Peculiar laws and restrictions have for hundreds of years denied the corn miller freedom to trade (and even personal freedom), encouragement to progress, and permission to compete for quality and cheapness of work. And the same restrictions have filtered and doled the flour of the people through feudal legislative channels, and retarded for many ages the production of that cheap bread with which the welfare of the masses is so intimately concerned. These matters seem as well worthy of study as the political and military troubles or glories of nations: and it is in this view that the authors have approached a subject which has hitherto been almost entirely overlooked.

Referring to the mills, all power corn mills are shown to be directly derived from the Greek watermill, the simple little machine with horizontal wheel, and devoid of gearing, which, under the designation "Norse Mill." survives in some places to the present day. The invention of the Roman watermill, of larger capacity and greater power, with a vertical wheel driving stones through the intervention of cog gearing,

Library

constituted a new departure; and afforded till modern times the model for the construction of the chief watermills of the world. The space of about a century intervened between the invention of the Greek mill, and the improvement upon its form effected by the Romans; and four centuries later, Rome devised the ship or floating mill, which also still remains in use in some parts of Europe and Asia. Thus water-milling alone prevailed till the twelfth century A.D.—or over a thousand years after the invention of the Greek watermill: when the windmill was added to the milling resources of the world. This new motor was rapidly adopted: the primitive tripod mill was elaborated in medieval times into the turret mill, and from this latter was eventually evolved the power mill of modern times.

We have endeavoured to trace the development of these various types of power motors, both wind and water, as concisely as possible, and as clearly as existing records seem to permit: indicating many mythical statements and doubtful theories of early writers, and quoting the earliest known allusion tending to approximate the period of the introduction of each variety. The ancient laws bearing upon corn milling, those of the Romans, Ostrogoths, and other early European nations are fully treated: while the later feudal customs and enactments which spring from them are left for consideration in another Volume, together with a practical illustration of the disastrous effects of those enactments as exhibited by the histories of various famous feudal mills.

We express our sincere thanks to many friends and correspondents who have furnished information respecting existing mills: to J. Robertson Christie, Esq., LL.B., Advocate, Examiner in Roman Law, Edinburgh University, who undertook specially for this work a complete translation of the laws of Rome relative to the College of Pistors, which are now for the first time published in the English language: and also to the various photographers and publishers who have furnished us with many of the illustrations necessary to the exposition of our subject.

19 Brunswick Street, Liverpool.
December 1898.

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WATERMILLS AND WINDMILLS.

SECTION I.—WATERMILLS.

CHAPTER I.

THE WATERMILL.

I. THE WATERMILL.

1. Origin and Designation.

Text: I. 128.

1. THE earliest power-mill of the world, the watermill, is of but comparatively recent introduction in the history of mankind. As already shown, it appears to be not more than two thousand years ago that the revolving quern came into use, preceding but shortly the slave and cattle mill, and these again only slightly preceding the watermill. The same term which had been given to the hand or cattle machine by the Greeks—μύλη, a mill—was applied to the new water-power machine, and in due course the Romans, following in the same vein, termed it "mola," distinguishing it from all other molæ by the distinctive name *mola aquaria*, its subsequent title for many centuries throughout Europe.

Still, for nearly four centuries after their introduction watermills had been practically nameless. When first the Greeks and next the Romans originally learned of watermills, not only did they esteem them very lightly, and long decline to work them, but they did not even term them "mills." The earliest classic writer who mentions the watermill of Greece, Antipater of Thessalonica, calls it by no distinctive appellation; and Strabo, the next to allude to it, uses

Text: II. ii.

I. THE WATERMILL.

1. Origin and Designation.

the term udraletes. The earliest writer to mention the Roman mill, Vitruvius, gives it the same generic name, "hydraula." Pliny, nearly a century later, alluding vaguely to some form of watermill, designates it merely "a wheel that grinds"; and about three centuries later, Ausonius of Bordeaux (A.D. 380), mentioning certain watermills, terms them simply "corn-stones swiftly whirled round by the stream":—

Text: II. iv.

Mosella: Freher, 1619, v. 362.

Præcipiti torquens cerealia saxa rotatu.

Palladius, who lived in the same century, seems to be the first to call the contrivance (then coming into general use) *mola aquaria*, a watermill:—

De Re Rust:

Si aquæ copia est debent pistrina suscipere: ut ibi formatis aquariis molis, sine animalium vel hominum labore, frumenta frangantur.

If water is abundant they should erect bakeries and construct watermills, so as to grind grain without the labour of animals or men.

With much reason the designation "mola" is considered by some philologists, however, to be older than the earlier Greek or the Latin tongue, and to be derived from the mystic Aryan language of Central Asia.

The extensive prevalence of the word—whether applied to the hand or power mill—affords indeed a wide field for speculation; and though this is beyond the scope of our inquiry, the following equivalents of the word may, in passing, be noted:—

Ulster Journ. Arch. 1856, Pt. xiii.

Greek	*Mile*	Walloon	*Molin*
Latin	*Mola*	Dutch	*Molen*
English	*Mill*	Frisian	*Mellen*
Old English	*Mille*	Old German	*Mulin*
Anglo-Saxon	*Mylne*	Modern German	*Mühle*
Welsh	*Melin*	Danish	*Möelle*
Gaelic	*Muileann*	Wendish	*Mlon*
Manx	*Mwyllin*	Swedish	*Möll*
Italian	*Mulino*	Swabian	*Müllin*
Spanish	*Molino*	Lithuanian	*Malunas*
French	*Moulin*	Bohemian	*Mlyn*
Bas Breton	*Milin*	Polish	*Mlyn*

Russian	*Melynica*	Magyar or Hungarian	*Malon*
Illyrian	*Malin*		
Laplandish	*Milla*	Albanian	*Muli*
Icelandic	*Mylna*	Sanscrit	*Molano*
Finnish	*Müllüw*	Persian	*Mûl*

I. THE WATERMILL.

1. Origin and Designation.

Some authors have endeavoured to trace the root of the word "mill" to the ancient Hebrew, prominent among them being Martinez (*Lexico-Philolog.* c. 1642), but their conjectures, which are adequately summarised by Hoheisel (*De Mol. Man. Vet.*, 1728), we must leave for the investigation of the curious.

2. Speculative Theories of Origin.

2. Apart from mythology and etymology, we find the probable origin of watermilling included in the speculations of some of the early historians and philosophers, though notably, on the other hand, it is passed over in entire silence as a thing unknown by others who might have been expected to have enlarged upon it.

Pausonius (A.D. 150) hazards the bold conjecture that milling was first invented in Laconia by Myletes, son of Lelex, first sovereign of that Spartan kingdom, who lived about 1500 B.C. This is a date that Pausonius could not have assigned as that of the origin of handmilling, which, of course, was known long before, and he therefore may be understood to have considered the period as that of the origin of watermilling. If so, there is no evidence in support of his unlikely suggestion.

Paus.: Lacon.: iii. c. 20.

Pomponius Sabinus (of so late a date as A.D. 1480) in an apparently confused passage states that the use of handmills was invented in Cappadocia: then (or there) also were invented the windmill and the horse-mill; while Paul, before the reign of Augustus, erected the first mill driven by water on the Tiber, when they destroyed the furnaces of the Greeks:—

Usus molarum ad manum in Cappadocia inventus, inde inventus usus earum ad ventum et ad equos: Paulo ante Augustum molæ aquis actæ Romæ in Tiberi primum factæ, tempore Græcorum cum fornices diruissent.

Op. Comment: 1544, *re* Virgil.

I. THE WATERMILL.

2. Speculative Theories of Origin.

Sabinus seems to be altogether in error. It has already been shown that, according to the ancient classic authorities, his statement as to handmills is incorrect; and in a later chapter his suggestion as to windmills is found to be untenable. The statement as to watermills seems to be due to some misconception of the circumstances attending the introduction of the Macedonian pistores into Rome by Paulus Emilius in 167 B.C.; for there is no corroborative evidence that Paulus ever erected a watermill on the Tiber. However, as stated, the text of the passage seems a little doubtful.

Text: I. 133.

Text: I. 98.

Posidonius (90 B.C.), who philosophically argues that man naturally derived the idea of grinding corn from the action of the teeth in chewing food,* carefully abstains from speculating as to the origin of watermilling.

Posid. ap. Seneca, Ep. 90.

Pliny about A.D. 70, one of the earliest writers upon the origin of inventions, names various of the ancients noted for their original discoveries in arts and sciences, including Ctesibius, who invented the hydraulic organ; but he makes no allusion to the discoverer of the watermill, which, though known in his day, was but little used, and which he himself once mentions, though apparently with but very slight interest.

Nat. Hist., vii. 38.

Text: I. 102.

Polydore Virgilius, medieval historian and philosopher (A.D. 1499), after various exact and curious researches into the origin of many inventions known in his day, is constrained to admit that though he finds watermills to be of late and windmills of still later origin, he has not discovered anything sufficiently well established to be worth recording as indicating the origin of water-power milling:—

Acutius est etiam invenisse et multo utilius, qua ratione frumentum ad decurrentis aquæ impetum molere possemus, quamvis

* Upon this subject Heringius gives a somewhat elaborate though not very profitable disquisition (*De. Mol. Vet.*, ii. 26).

2. Speculative Theories of Origin.

non utique, recens sit tamen apud idoneos auctores suo nomine caret, vulgus molendinum vocat.

More ingenious and useful would it be to have discovered to what origin we owe the milling of grain by the force of running water: though the invention is by no means recent, yet the term by which a mill was commonly known—molendinum—does not appear in the works of the ancient writers.

De Rerum Inventoribus 1663, l. iii. c. 18.

Later authors, as Cardanus, Magnus, Hoheisel, and Heringius, whose several disquisitions are noted in due course, add nothing to the quest. But after all, we have in the present day possibly the whole of the sources of information that had most of the ancient and all the medieval writers; while the extended researches of modern times have, perhaps, brought us into closer view of actual facts; the sum and substance of these, as will be shown, establishing watermilling as of Greek origin at a period only shortly preceding the birth of Christ.

CHAPTER II.

THE GREEK MILL (HORIZONTAL TYPE).

II. THE GREEK MILL.

1. Of Antipater.

1. THE earliest known allusion to a watermill, the first power mill of the world, occurs in an epigram by Antipater of Thessalonica, who flourished at about 85 B.C. :—

> Ye maids who toiled so faithful at the mill,
> Now cease your work, and from those toils be still:
> Sleep now till dawn, and let the birds with glee
> Sing to the ruddy morn on bush and tree;
> For what your hands performed so long and true,
> Ceres has charged the water-nymphs to do.—*Tennant.*

Or, according to the rendering of a translator of a less poetic and more practical character :—

> Cease your work, ye maids, ye who laboured at the mill. Sleep now, and let the birds sing to the ruddy morn. Ceres has commanded the water-nymphs to perform your task; and these, obedient to her call, throw themselves on the wheel, force round the axle-tree, and so the heavy mill.—*Beckmann.*

In this elegant metaphor we discern the maids and slaves of the saddle-stone, the mortar, and the quern, liberated from their toil by the discovery that quern-stones could be revolved by the force of a running stream.

The exact date at which this *jeu d'esprit* was written is unfortunately, however, a matter of some doubt. Three Greek poets named Antipater flourished within a comparatively short period of each other; and of the great number of epigrams still extant referable to them, the authorship of some—the present among the number—is not clearly to be ascertained. "The ancient copyists not having been

II. THE GREEK MILL.

1. Of Antipater.

sufficiently careful to distinguish the three writers, there is some confusion in the classification of the poems attributed to them." Moreover, this particular epigram, though written about a century before Christ, was not edited till so late a period as the seventeenth century, when it was published by Salmatius (C. Saumaise) :—

Nouv. Biog. Didot, 1852.

Quo tempore autem vixerit ille Antipater et utrum Sidonius sit au Thessalonicensis, nam duo fuerunt Antipatri epigrammatarii, in editione Græcorum epigrammatum, pluribus disputabimus: certum tamen habeo illius epigrammatis auctorem esse Antipatrum Thessalonicensum qui temporibus Ciceronis vixit: ætate igitur Ciceronis inventæ sunt istæ rotæ aquariæ quæ molendinas versant et ὑδραλέτης usus tunc primum cognitus.

Hist. Aug. Scrip.: Paris, 1620, 193.

At what date this Antipater lived, and whether he were Antipater of Sidon or Antipater of Thessalonica, both of whom were epigrammatists, we shall consider fully in our edition of the Greek epigrammatists. I consider the author of the epigram to be Antipater of Thessalonica, who lived in the time of Cicero (106–42 B.C.). It was in the time of Cicero, therefore, that were invented the water-wheels which turn mills, and that the use of *udraletes* was first known.

Adopting the opinion of Salmatius, the epigram is to be taken as recording the invention of watermilling at about 85 B.C.*

2. Of Strabo

2. The second known watermill is that of Mithridates, King of Pontus, in Asia, mentioned by Strabo. The Greek chronicler, referring to the defeat of that king by Pompey in 65 B.C., states that in the mountainous region of Paryadres, in Pontus, where were many fortresses well supplied with water, Mithridates had built his capital cities, Eupatoria and Amisia, and had here made his last and ineffectual stand against the legions of Rome. At Cabira, adds Strabo, the king had established an enclosed park, &c., as well as a certain contrivance, ὑδραλέτης, *udraletes*, a hydraulic machine, which is agreed by commentators to indicate a watermill.† Mention of the mill in this connection among the treasured possessions of the king, seems to

Geogr., xii. 8 : Almelov. ed. 834.

* The epigram may also be found in *Mémoires de l'Acad. des Inscrip.*, ii. 315, and in *Analecta Vet. Græcor*, ii. 119.

† In some Latin translations of Strabo this word is stated to be omitted, as in that of Jansen (Amsterdam, 1652, ii. 196).

II. THE GREEK MILL.

indicate its being esteemed a very special property—something of considerable interest, and no doubt great

2. Of Strabo.

rarity; though Strabo does not distinctly claim it as a novelty, nor yet as a Cappadocian invention. Much importance attaches of course in this connection to the reliability of Strabo's evidence; and it is interesting to note, therefore, that while ordinarily he is accepted as a writer of profound exactitude, with regard to this particular matter he may be supposed to have been particularly well informed. He had full personal knowledge of the cities in question; he had been born at Amisia at about the date of its capture (his relatives having held high office under the king), and had lived there during a great part of his long life; the local information evident in this particular part of his work being, in fact, so pronounced, as to evoke from the most observant of his modern editors the remark:

Hambleton and Falconer, 1857, Intro.

"Book XII. [that with which we are concerned] shews evidence of Strabo's great care and desire for accuracy." The book in question was written, according to the internal evidence of the work itself, between the years A.D. 20 and 25, or about from eighty-five to ninety years after the defeat of Mithridates and the discovery of his watermill, the second on the records.

3. Pliny's Doubtful Mill.

3. Pliny (about A.D. 75) has already been quoted as mentioning mills driven by water. Critics differ upon the true meaning of the passage, which, as given by Brotier, is:—

Nat. Hist., xviii. 23.

Major pars Italiæ ruido utitur pilo: rotis etiam quas aqua verset obiter, et molat.

In the greater part of Italy is used a roughened pestle, and wheels also that water turns round as it flows along; and so they mill.*

Text: I. 102.

If the remark cannot be considered as applying to pestles driven by water-wheels, as already discussed, then it may be understood to refer to the Greek mill,

* The seventeenth-century commentators Turnebbe and Chifflet translate the passage: "In the greater part of Italy they use a roughened pestle or wheels turned by water, and sometimes also they employ for the purpose the mill"—Ou de roues que l'eau fait tourner, et parfois aussi ou y emploie la meule.

II. THE GREEK MILL.

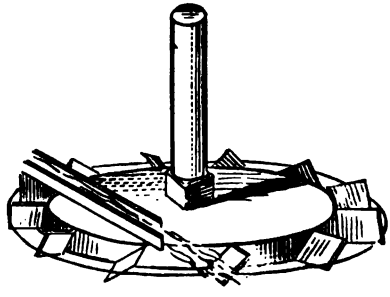
3. Pliny's Doubtful Mill.

which in Pliny's day was the only one that could possibly be in use throughout the greater part of rural Italy. The Roman type of watermill was certainly known in the time of Pliny to the philosophers of Rome, but, so far as can be traced, it was not used there nor elsewhere. The Greek mill of Antipater, on the other hand, was in use about 160 years before, and probably by the time that Pliny wrote had been adopted in the hilly regions of Italy by the rural population, who had up to then ground grain by hand.

4. Construction.

4. In classic times no evidence occurs indicative of the nature of the Greek watermill, and in modern ages its existence has been almost entirely overlooked. Still there are at hand abundant means not only of proving its existence as above, but of judging from other sources of its form and construction. Of two types of watermills known in, say, the time of Pliny, one was of an exceedingly simple and the other of a comparatively complicated nature; and various considerations appear to warrant the assumption that the simpler was the more early of the two, and, in fact, was the Greek mill now under notice. The nature of the quaint contrivance that thus bears the honour of leading the way in the adoption of power milling may briefly be indicated.

The water-wheel lay vertically upon or in the water, and revolved an upright central shaft standing upon a stone in the bed of a stream, or else in a dry channel to which water was conveyed by a trough. The upper end of the shaft or spindle passed through the lower of the two quern-like grinding-stones placed above, but was fixed



Greek Mill.

II. THE GREEK MILL.

4. Construction.

to the upper stone. Thus the water-wheel, the shaft, and the upper stone all revolved together. Such a mill, erected upon a small stream, would only grind very slowly, as one revolution of the water-wheel would of course only produce one revolution of the grinding-stone. Subject to this drawback, however, the extreme adaptability of the mill to the limited demands of early times, its simplicity of construction, together with the absence of cogs or other complicated gearing—all combined to ensure it a large and lasting popularity far beyond the confines of early Greece. Its use spread throughout Europe till, about the eighth century, it was generally superseded by the larger and more powerful Roman watermill; and at the present day, in Europe and Asia, either the mill itself is found in use, or its prehistoric relics testify to its former existence.

5. In Mediæval Greece.

5. In Greece it survived till late in the Middle Ages. The sixteenth-century French naturalist and traveller, Belon, saw at Mount Athos, in Greece, mills driven by streams no thicker than a man's arm, the wheel small, and "made in a different manner to ours," but nevertheless capable of turning millstones as large as might be desired: La roue faite d'autre manière que ne sont les nôtres, et cependant elle pourrait faire tourner quelque grande meule qu' on voudrait. In this mountain mill, overlooking the Ægean Sea, with its water-wheel differing from that of French mills, we may doubtless recognise the still perpetuated primitive little machine which evoked the wonder and inspired the ode of Antipater of Thessalonica.

Choses Mémorables: Paris, 1553.

6. In Syria.

6. As on Mount Athos, so in the Holy Land, on Mount Lebanon and Mount Carmel, the same little mill was seen, in 1668, by Darvieux, the politician and traveller, who is now chiefly famous for having declined, at the hands of Innocent XI., the title and dignity of Bishop of Babylon. "The mills on Lebanon

II. THE GREEK MILL.

and Carmel bear a great resemblance to those found in many parts of Italy. They are exceedingly simple, and cost little. The mill stone and wheel are fastened on the same axis. The wheel (if it can be so called) consists of eight hollow boards, shaped like a shovel, placed across the axis." Italy, also, is thus seen using the mill as in the time of Pliny.

6. In Syria. Des Arabes, &c.: Paris, 1717.

7. In France. Itin. Gall., 56, 262.

7. In France the mill is described by Paul Henzer in 1588:—"On the Garonne they have a curiously made mill, in which the wheel is much smaller than in ours, and has a shaft inserted in the centre of the floats or vanes, which revolve with great rapidity. The wheel is not set perpendicularly upon the water, but moves horizontally in it. The millstones are much larger than ours, and are composed of so many pieces skilfully joined together that one stone is estimated to be worth a thousand crowns." Still the small water-wheel rapidly revolving would certainly cause the millstone to turn with equal rapidity; and the Greek mill, as a rule, worked slowly. As Henzer mentions that the stones were exceedingly large, it is possible that in this case gearing intervened and a large cog-wheel reduced the speed of the stone; and if so, this mill was not of the pure Greek type.

CHAPTER III.

THE NORSE MILL (HORIZONTAL TYPE).

III. THE NORSE MILL.

1. Of Greek Type.

1. IN Northern and Western Europe, and in Asia, the primitive mill, with its horizontal water-wheel of Greek type, has been in general use from prehistoric times, and in some places survives still. Ordinarily it is known as the Norse or Northern mill, and under this designation we propose to refer to its medieval and modern occurrence.

2. In Wales.

2. The mill had early become established in Britain. There seems, indeed, to be no remaining evidence of its use in England; but there can be no doubt that when the mill was equally common in Scotland, the Isle of Man and Ireland, it was also ordinary in this part of the kingdom. The progress of ages, which enforced improvements and changes in England long before other parts of the kingdom, seems in this case to have early abolished the primitive little Norse mill, and left here, so far as we are aware, no single trace of the original type in existence.

In ancient Wales circumstances did not favour the construction of many permanent mill structures, and it is not surprising that relics of the Norse mill do not appear to have been found there. Etymologists, however, may perhaps consider that the ancient British word "rhôd" bears some suggestion of the British Norse mill. The word is stated on good authority to be not merely the equivalent of the Latin "rota," a wheel, but of the more comprehensive Sanscrit "rotha," which implies both wheel and axle; and it

Arch. Camb., 1850, Supplt.

III. THE NORSE MILL.

was applicable, therefore, at once to the wheel and axle of a chariot and the wheel and spindle of a Norse mill, which latter some Welsh antiquaries consider indeed to have been copied from the former.

2. In Wales. Text: II. viii.

3. In Ireland. Text: II. viii.

3. In Ireland, over half a century ago, the discovery of relics of watermills of remarkable form led to a systematic exploration, which eventually established the fact that Norse horizontal mills have extensively been in use there from, at all events, the seventh to the eleventh century. The Irish laws ascribed to King Cormac of the third century, as well as certain traditions of the same king, seem to refer to Norse mills; but the actual date both of enactments and legends is so extremely doubtful, as scarcely to warrant their acceptance as evidence of any Irish mills existing in the third century. The Kilkenny Archæological Society (now the Royal Archæological Society of Ireland), under whose auspices the investigations were conducted, found the black oaken remains of these ancient machines in the dried-up channels of old streams, covered sometimes with turf and sometimes with beds of clay from 6 to 10 feet thick; the clay having evidently been purposely placed upon the mills in some time of rapine to conceal them from marauders. Without describing in full these various discoveries, some few of the more interesting details may be stated.

Kilk. Arch. Soc., i. 154.

At Ballymartin was found, at a depth of 6 feet below the surface, a framework of black oak placed across traces of an ancient water-course. It measured 11 feet by 6 feet, and supported a flooring of boards 2 inches thick and, some of them, 3 feet wide, all having been evidently dressed with the adze. At Bramblestown, near Gowran, in deepening a river-course a similar platform framework, together with fragments of millstones, was exposed. One of the latter had been 2 feet 5 inches in diameter, and the marks of

III. THE NORSE MILL.

3. In Ireland.

the position of the rynd on the upper stone were still apparent. Discoveries at Bantry and Mallow revealed the same general features; but here were also found water-troughs of black oak about 12 feet in length, which had evidently been used for the purpose of conveying water to the mills to create a fall. The oaken shaft or spindle was also found. In the neighbourhood of these discoveries is one of the raths or enclosed prehistoric camps. A mill at East Carbery, covered with a stratum of clay, showed by the fixed ground timbers the size of the working part of the mill to have been about 8 feet by 5 feet. Two pair of millstones here were neatly finished and well faced, the upper being 2 feet in diameter and 1½ inch thick at the eye in the centre. The stream was very small, and had a fall of only 5 feet. "The mill could easily be restored. The water-wheel should be made very small, with floats. A carpenter could make one in about a week." At Shannacashell, county Cork, the mill seemed to have been burnt down, but on the floor were a pair of millstones, a wooden shovel, and the shaft of a wheel. The upper stone was 8 inches thick and 2 feet in diameter, the under stone being only 3 inches thick at the centre. The shaft, about 6 feet in length, was rather of an ornamental character, and contained at the lower end a series of mortices for the reception of the water-vanes. This mill was found buried deeply under turf.

R. I. A. Mus. Cat., 207.

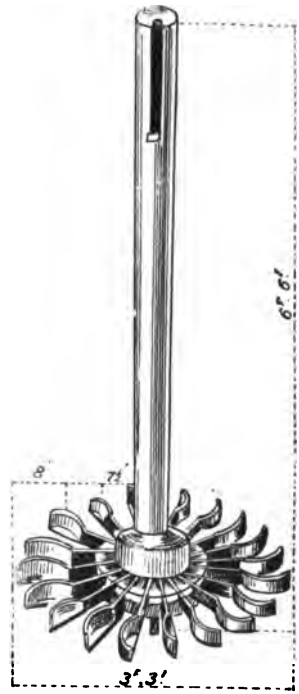
In 1838 three relics of the floats or vanes of a Norse mill-wheel were discovered at Banagher, county Derry, all (except one made of yew) being of black oak. They were of scoop-like shape, the dished end serving to catch the force of the stream more effectively than a flat board. Each float was 14 inches in length, perforated, and fitted with a projecting ledge at the narrow end for fixing into the shaft. It was considered at the time of the discovery that they formed

III. THE NORSE MILL.

3. In Ireland.

parts of a machine for fulling cloth; but clearly they are of the same type as the relics already described.

One of the most complete relics of the wheel was described in 1856 by MacAdam, who states the accompanying drawing to accurately represent it, except only such few parts as were restored. It was found "a number of years ago" in the bog of Moycraig, at the Grange of Drumtullogh. The nave of the water-wheel and the upright shaft are cut out of one solid piece of oak, the entire length being 6 feet 6 inches. Round the nave are inserted nineteen curved vanes of oak, ten of which were found intact. They are fixed into the nave by mortices, and further secured by oaken pins. At the top of the shaft is shown the simple arrangement for gauging the position of the upper stone, this being nothing more than a vertical groove or slot, in which is fitted a wedge for raising or lowering the top stone. Portions of a precisely similar mill from county Down are in the Belfast Museum. MacAdam combats the theory that the Romans introduced watermills into Ireland, contending that, "muileann," the equivalent of "mill," did not originate from the Latin but from some older language, and that the mills whose ancient remains have been unearthed in Ireland were established before the appearance of the Romans in Britain. This theory of course relates solely to Norse mills, not to those of Roman type.



Ancient Norse Shaft.

Ulster Journ. Arch. 1856, 6.

III. THE NORSE MILL.

The identity of the ancient and modern forms of Norse mill may be fully established :—

3. In Ireland.

Montgomery MSS., c. 1698, fol. 321.

In county Down issue many rills and streams, and on almost each of them a townland had a little miln for grinding oats. The milns are called Danish or ladle milns; the axel-tree stood upright, and ye small stones (or querns, such as are turned with hands) on ye top thereof. The water-wheel was fixed at ye lower end of ye axel-tree, and did run horizontally among ye water, a small force driving it. I have seen of them also in ye *Isle of Man*, where the Danes domineered as well as here in Ireland, and left their custom behind them.

4. In the Isle of Man.

4. The foregoing extract from the Montgomery MSS. alludes to the Norse mill being found in the Isle of Man. Another item of evidence on the same point occurs :—

Gibson's Camden : ii. p. 1448.

In the Isle of Man, on many of the rivers, is a cheap sort of mill, which, as it costs very little, is no great loss though it stand idle six months in the year. The water-wheel lies horizontal, consisting of a great many hollow ladles, against which the water brought down by a trough strikes, and gives motion to the upper stone, which, by a beam of iron, is joined to the centre of the water-wheel.

5. In Scotland.

Soc. Ant. Scot., 1881, 135.

5. In Scotland the mill has long been known under the designation Norse mill. In the islands of Colonsay and Oronsay the small meal mills built across streams, and now driven by ordinary vertical wheels, were anciently worked by horizontal Norse wheels, and known under the term *muileam dubh* or black mills. One of them has been pointed out at the farm of Ballerdomin Mor. The sides of the small stream had been built up with dry stone walling for a length of 8 or 10 feet to a height of about 4 feet, with a circular recess, in which the horizontal wheel turned. The stream was bridged by four or five long undressed stones, upon which the mill-hurst had been constructed, and in one of these remained a portion of the hole through which the spindle from the wheel beneath had passed to the millstone. Other ruins are mentioned at Machrines, Bulnahard, Uragang, and Ardskinnish. No information could be obtained as to these latter watermills having been utilised for grinding meal during

III. THE NORSE MILL.

5. In Scotland.

living memory, though it was said they had been to some extent utilised for bruising malt for making smuggled spirits. Throughout the district the Norse mill, either in use or in ruins, abounds. Wherever a small stream runs rapidly down to the sea may be found a series of the little mills situated at no great distance from one another; in some instances a double mill-race running under the structure, with a wheel and pair of stones at each end of it, the mill of course possessing no cog-gearing, and a separate wheel being thus always required for each pair of stones. The illustrations depicting the Norse mill of Scalloway, and of Foula, Shetland, give a fair general idea of the character of the minute structure, and of the manner in which it was built across the little stream coursing down from the hills. MacAdam quotes various allusions to it.

Soc. Ant. Scot., 1883, 292.

Scalloway—*Sketch by Mr. E. W. Cox.*

III. THE NORSE MILL.

5. In Scotland.

Foula, Shetland—*Photo. by Dr. J. H. Evans.*

Landt's Feroe, 1810, 293.

In the Faroe Islands the construction of a watermill is exceedingly simple. The building for the most part consists merely of wood, the roof being supported by four pillars; but to save timber these pillars are sometimes built of stone mixed with mud. It is entirely open below, so that the water can have a free course through it. On the ground is placed a loose beam (sufficiently heavy to retain its position by its own weight), having in the middle a piece of iron with a smooth hole in it, made to receive the gudgeon of a perpendicular axle, which proceeds up to the millstone, and this axle supplies the place of a crown wheel and spindle. To the upper end of the axle is fixed a round rod of iron, which passes through the lower stone, and which supports the iron cross that bears the upper millstone. At the lower end of the axle there are eight leaves or boards morticed into it, about 18 inches in length and a foot in breadth, and from 1 to 1¼ inch thick. These leaves are placed in an oblique direction so as to turn their flat sides to the water which falls upon them; and the spout, which must give the water a sudden fall, is placed with its lower end close to these leaves. From one end of the beam lying on the ground which supports the axle and upper millstone a piece of wood rises in a perpendicular direction towards the millwork, where it rests on wedges; and by pushing in or drawing out these wedges the upper stone can be raised or lowered. The millstone makes a hundred revolutions in a minute; but as the stones in general are small and have no furrows they grind slowly, and are not calculated for the preparation of grits or barley.

III. THE NORSE MILL.

5. In Scotland.

In the Shetlands numerous slender rills were ambling down the dales. These occasionally served to supply some small mill, the presence of which was signified by a low shed of unhewn stones stretching across a diminutive streamlet, over which it was possible in many places to stride; compared indeed with a watermill of England or Scotland, the grinding apparatus of Shetland seemed destined for a race of pigmies. The millstones are commonly formed of a micaceous gneiss, being from 30 to 36 inches in diameter. Under the framework by which they are supported is a sort of horizontal wheel of the same diameter as the millstones, named a Tirl, consisting of a stout cylindrical post of wood about 4 feet long, into which are morticed twelve small floats placed in a slanting direction. It has a pivot at its under end, which runs on a hollowed iron plate fixed on a beam. An iron spindle attached to the upper end of the Tirl passes through the lower millstone and is firmly wedged in the upper one.

Hibbert's Shetlands, 1822.

In Lewis the mills are probably the greatest curiosity a stranger can meet with. There is scarcely a stream on which a mill is not to be seen. These mills are of very small size and very simple construction. The water passes through the middle of the foundation of the structure, where the spindle of the wheel, a solid piece of wood, generally 18 inches in diameter, stands perpendicularly. There are nine pieces of boards 8 inches broad and 1½ foot long fixed in the wheel.

New Statistical Account of Scotland, 1845.

The expense of a Highland mill does not amount to a great many shillings. The millstones are about 3 feet in diameter, the upper being fixed on a vertical axis about 4 feet long, which passes through the floor of the hurst and works on any casual stone by an iron pivot.

M'Culloch's Western Islands, 1819, ii. 30.

In Lewis and the Shetlands the Norse mill is still common, being continued, says Professor Mitchell, rather from choice than necessity or ignorance. The same authority has given an excellent description of these curious survivals of bygone times. The mills are small, and entail no great expenditure either for building or working. They are convenient and easy to operate; and though grinding but slowly, are amply able to meet the small demands of the country-side. "Many of the people who build these mills know, as well as any of us, the general superiority of an overshot water-wheel, and the unfitness of the wheel they use to do anything more than the small amount of work which they require of it, and not a few of them thoroughly understand the waste of power in the mill;

III. THE NORSE MILL.

5. In Scotland.

but, to use the words of one of the crofters, 'If I get all the power I need from the burn as it flows past, where is the foolishness in leaving the rest unused?'" Occasionally such a mill is the joint-property of one or more townships, in somewhat the same manner as grain-crushing stones in the centre of a prehistoric

Text: I. 21. 85.

settlement or a modern African village we have seen to be the common property of the entire community. Like the latter, the Norse mill is worked by the

Past in Present: Mitchell, 1876, 39.

Shetlands—*Exterior.*

owners of the grain. As shown in Mitchell's sketches, the little hurst of timber, roofed with thatch or turf, is of merely sufficient size to contain the mill. There is no resident miller. The door usually stands open

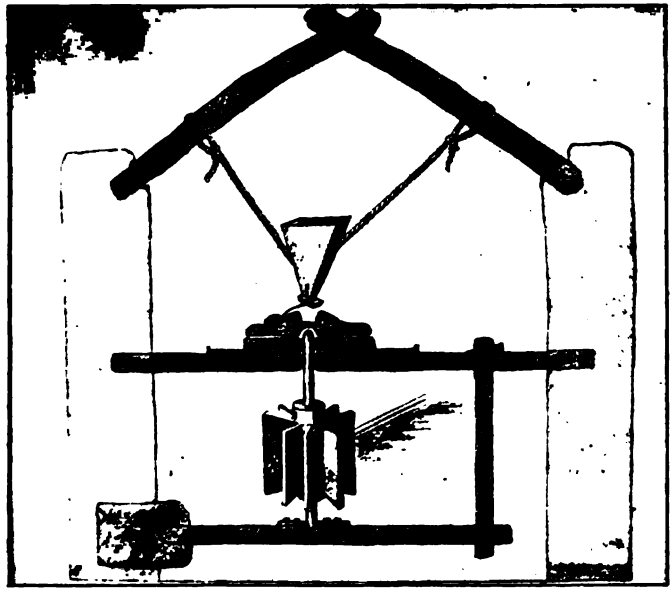
Text: II. vii.

to all comers, precisely as in the ancient Laws of Bohemia, elsewhere cited, it, together with the Church, the Court, and the Hall, is stated always to do. The farmer or peasant carries thither his sack of grain, sets the mill in motion, and waits till his corn is ground. A

III. THE NORSE MILL.

5. In Scotland.

common mill of this character is assessed at about £7 actual value, the still smaller establishment belonging to a single farmer being valued, in complete working order, at about £3. The hopper hangs from the roof by ropes of straw. The feeder attached to it receives the necessary vibratory motion in a curiously simple manner. A pebble being fastened to it by a piece of string, and loosely laid upon the top of the upper



Shetlands—*Interior.*

stone, is jogged about by the roughness of the surface of the latter as it goes round, with the result of causing the string to drag irregularly at the feeder, and produce the jerking motion necessary for shaking out the grain. The hurst is of the most insignificant proportions, the doorway being so low that access cannot be had without stooping; one, for instance, only 4½ feet high and 2½ feet wide, reminding us of the similarly low doorways of Algerian huts, to enter which

III. THE NORSE MILL.

every adult must bend in veneration of home and of Allah. The grinding-stones are rarely larger than 3 feet, and sometimes are as small as 2 feet 3 inches in diameter. They deliver the meal off all round their edges, as does a quern, and it is collected upon a space on the ground marked off by a ledge of wood.

5. In Scotland.

The same type of mill is described in a paper read by Mr. James Jardine to the Hawick Archæological Society to have abounded in that district, a list of no fewer than fifty-one being enumerated within a radius of about eight miles. Wonder is manifested "where the millers obtained all the grain necessary to keep the mills going"; but it will be remembered that there were no millers, and the mills never were going except at intervals. They were "the old horizontal mills, built mostly of timber, and costing space for little more than the millstones, the upper of which was moved on the lower by a vertical iron rod [or anciently a wooden shaft] descending into a socket in the bed of the stream. The usual diameter of the stones was from 2½ to 3 feet, and the upper was usually concave on the lower side."

Milling, Jan. 1897.

6. In Norway.

6. When the controversy as to the identity of the early Hibernian mills was in progress, Mr. R. Chambers, who had then recently visited Norway, recognised the type as that of the horizontal mills of that country, and published the fact in "A Tour in Norway," in his popular *Journal*. The Norwegian Norse mill is still to be found in ordinary use, housed in structures as rude as may have been that seen by Antipater nearly two thousand years ago. Mr. Bennett recently visited many of these primitive structures, which were usually found in places among the hills, very difficult of access, but always, evidently, fully equal to the demands of the scattered populace. The simple but effectual method of stopping the mill comprised nothing more

than shutting off and diverting the little stream into another channel, so that it passed alongside instead of beneath the mill hurst. The illustration shows the shaft-wheel in its place in the bed of the stream

6. In Norway.

Norse Shaft—*Photo. by Mr. P. Lange.*

from which the current has been thus diverted. Mr. E. C. Hart (Robinson & Son, Rochdale) remarks of the Norwegian mills: "In Western Norway we found many of these little mills in all sorts of places. So far as I could see they are all home-made, with the exception of the stones. In all the mills I looked into each had a pair of stones and hand sieves. The spindle is made out of a pine-tree, with vertical teeth, there being paddle-blades at one end and stones at the other. Each cottager carries his own corn himself to the mill, and then carries it home again. When I say some of the mills are half-way up a high mountain, you can well imagine that it is no easy

Milling, Jan. 1897.

III. THE NORSE MILL.

task for the man. The photo. shows a mill and the snowfields."

6. In Norway.

Norway—*Photo. by Mr. E. C. Hart.*

7. In Roumania.

7. In Roumania they have been recently seen at work by Mr. Wilson Marriage of Colchester, who entertains a high opinion of their value for the kind of work required from them. Mr. Marriage, in a contribution to *Milling*, accompanied by a photograph, says: "The Norwegian mill bears a striking resemblance to the mills one sees in the Carpathians, and I should think that the mills of Norway and Roumania are almost identical in the method of working. A wooden upright shaft has a home-made turbine at the foot, and drives a single pair of stones. Above the stones

7. In Roumania.

are a large hopper and the usual feeding arrangements, shaking into the eye of the stone a few—very few—grains of maize, the meal after grinding dropping into a bin. The mill is started by shifting the wooden

Roumania—*Photo. by Mr. W. Marriage.*

flume conveying the water of the mountain stream on to the wheel. I saw several of these mills at work with no attendant. They are perfect examples of automatic mills, and the working expenses are reduced to a minimum. The owner brings a supply of grain, fills the hopper, sets the mill going, locks the door, and does not need to return for a day or two. They run by themselves without employees. It is a far cry from Norway to the Carpathians. Yet we see here two mills which might have been constructed by the same workman, so similar are they in almost every detail, from the foundation of rough stones to the 'log cabin' mode of building."

III. THE NORSE MILL.

8. In China.

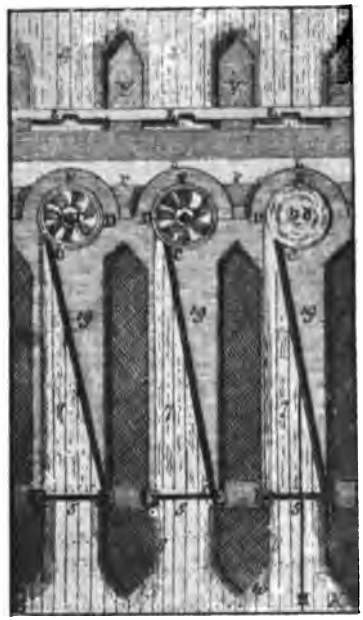
8. In "the Great West" of China the same horizontal mills were seen in frequent use within the last two or three years by the travelled Mrs. Bishop (Isabella L. Bird), F.R.G.S., who, in a recent communication to us, states that she saw them in large numbers, especially on the great Ching-tu plain, where, no doubt, they have been in continuous use from very primitive times.

9. Modern Efficiency.

9. Horizontal watermills with a direct or forward action of the wheel—a distinct development of the simple Norse mill—were introduced on a somewhat large scale in France a little over a century ago.

Arts & Sciences, 1755, iii. 2077.

Of all the watermills that have hitherto been thought of, there are none more ingenious or simple than those which have been invented at Toulouse, in Languedoc, the description of which, taken from Belidor, is as follows:—

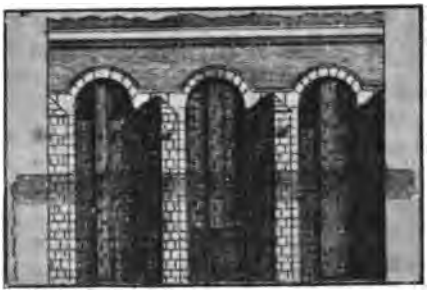


(Fig. 1.)

Fig. 1 shows a plan of the mason work serving as piers to several arches which shut with sluices, and are represented in Fig. 2, being an elevation of the same. Every sluice answers to a channel which grows narrower continually till it comes to C D, where it terminates at a cylindrical vessel C E D, without any bottom likewise of stone work. The water confined behind a sluice passes through and enters with great velocity into the channel, and not finding so large a passage to run out by as that by which it entered, it swells and falls with the greater force into the cylinder, forming a whirlpool, and turns a horizontal wheel at the bottom of it, which is represented at F. The axle of this wheel is fixed to the mill-stone. . . . These mills are so disposed that all the parts belonging to one may be taken to pieces without hindering the going of the rest, as every one has its own channel, which needs only to be shut. As there is only 5 feet 4 inches from the centre of one millstone to another, you may build twelve mills upon a river

of ten or twelve fathoms in breadth; and as there is neither cog-wheel or trundle-head, nor any friction besides that of the pivot of the wheel, they seldom want repairs. The wheel is 3 feet in diameter, and made of one piece of the body of a tree. There might be several curious inquiries made for improving this wheel. We shall only mention that the bending of the ladles on the wheel ought to be circular, and the inclination which they have from top to bottom ought to make an angle of 54° 44″ with the axle of the wheel, since it is the same case as the sails of a windmill.

9. Modern Efficiency.



(Fig. 2.)

Ferguson, who strongly recommended the Norse mill as used on the Continent for the simplicity of its construction and ease of working, calculates the efficient development of its power as follows :—

Since the millstone of horizontal mills performs the same number of revolutions as the water-wheel, and since a millstone 5 feet in diameter should never make less than forty-eight turns a minute, the water-wheel should never make less; and in order that the effect may be a maximum, the velocity of the wheel must be one-half that of the current. . . . Suppose the millstone, for example, to be 5 feet in diameter, and the water-wheel 6 feet, it is evident that the stone and the wheel must at least revolve forty-eight times in a minute; and since the circumference of the wheel is 18.8 feet, the floats will move through that space in the forty-eighth part of a minute, that is, nearly at the rate of 15 feet per second, which, being doubled, makes the velocity of the water 30 feet, answering (as appears from tabular calculations) to a fall of 14 feet. But if the given fall of water be less than 14 feet, we may procure the same velocity for the millstone by diminishing the diameter of the wheel. If the latter, for instance, is only 5 feet in diameter, its circumference will be 15.7 feet, and its floats will move at the rate of 12.56 feet in a second, the double of which is 25.12 feet per second (the velocity of the current), which answers to a fall of less than 10 feet. . . . As the diameter of the water-wheel should never be less than seven times the breadth of the mill-course, there will be a certain height of the fall beneath which we cannot employ horizontal wheels without making the millstone revolve too slowly. This applies only to mills for grinding corn, in which the millstone is fixed on the shaft of the water-wheel, and must move

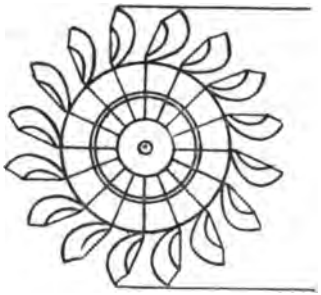
Natural Philosophy, Ferguson: Brewster, 1823,

III. THE NORSE MILL.

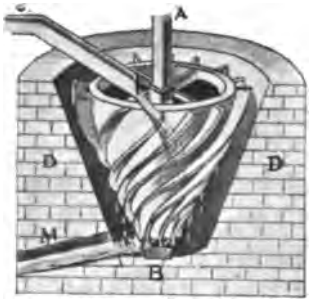
with a determinate velocity; for any other purpose they may be used however small the fall of water.

9. Modern Efficiency.

In the southern provinces of France, where horizontal wheels are very generally employed (1823), the floats are made of a curvilinear form, so as to be concave towards the stream; and notwithstanding certain defects, these wheels are always superior to those with flat floats, since, in the former case, the water acts by its weight as well as by its impact. [Curved floats, it will be remembered, are found in the ancient Irish specimen already illustrated.]



In the provinces of Guyenne and Languedoc another species of horizontal wheel is employed in turning machinery. It consists of an inverted cone, with spiral floats of a curvilinear form winding round its surface. The wheel moves on a vertical axis in the chamber to D, in the diagram annexed, and is driven both by the impulse of the water from C C and, when the impulse is spent, by the weight of water as it descends along the spirals.



From these evidences it will, we believe, be agreed that the whole of these mills, of one common form and for one common use, were all of one common origin, and that the primitive type from which they sprang may be discerned in that of the little mills of Antipater and Mithridates.

10. The Turbine.

10. The last development of water-milling, the introduction of the turbine, seems to have been directly derived from the action of the primitive Norse mill, and to have originated towards the close of the last century. We find it stated that the turbine was invented by Fourneyrou in 1823; but Ferguson asserts that the first wheel driven by the reaction of water, and comprising the germ of the modern turbine, was called Dr. Barker's, or sometimes M. Parent's wheel, from its early inventors, and that Desaguliers seems

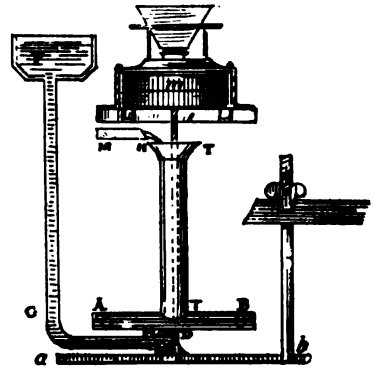
Natl. Phil.: Ferguson and Brewster, 1823, i. 58.

III. THE NORSE MILL.

10. The Turbine.

to have been the first to publish an account of it. The close similarity of the working of the voluted cone wheel, the latest form of the Norse wheel, to that of the turbine, will be immediately recognised, the important divergence being that the Norse wheel is driven in one direction by the direct force of the water, while the turbine is turned in a reverse direction by the reaction of the current. Of this interesting development of the primitive motor it is here merely necessary to state sufficient to indicate its early history, taking as suitable authorities Ferguson and Brewster.

Sir George Saville says he had a mill in Lincolnshire to grind corn, which took up so much water to work it that it sunk his ponds visibly, for which reason he could not have it kept in constant work; but now, by Dr. Barker's improvement, the mere waste water from the ponds is sufficient to keep the mill constantly at work.



In the diagram *c d* is a vertical axis moving on the pivot *d*, and carrying the upper mill-stone, after passing through an opening in the fixed lower stone. Upon this axis is fixed a vertical tube, *t t*, communicating with a horizontal tube, *a b*, at the extremities of which, *a b*, are two apertures in opposite directions. When water from the mill-course *m m* is introduced into the tube *t t*, it flows out of apertures *a b*, and consequently the whole machine is put in motion by the reaction of the water. The bridge tree is elevated or depressed by turning the nut at the end of the lever.

In this form of the mill the length of the axis *c b* must always exceed the height of the fall *h d*, and therefore when the fall is very high, the difficulty of erecting such a machine would be very great. M. Mathou de la Cour proposes to introduce, in such a case, the water from the mill-course or reservoir by a pipe entering at *d* into the horizontal arms *a b*, which are fixed to an upright spindle *c t*, but without any hollow tube *t t*. The water will obviously issue from *a b* in the same manner as if it had been introduced at the top of *t t* as high as the fall.

An improvement on this form was published in Rozier's *Journal de Physique*, January and August

III. THE NORSE MILL.

1775, and again, as a novelty, twenty years after in *Trans. Amer. Phil. Society*, 1795.

10. The Turbine.

Another form of the motor was suggested (about 1820) by Albert Euler. He proposed to introduce the water into a circular cavity in a fixed vessel of the shape nearly of a cylinder. The hollow of this vessel had several inclined apertures for the purpose of making the water flow out with a proper obliquity into the inferior and movable vessel. This inferior vessel, which had the form of an inverted frustrum of a cone, moved about an axis passing up through the centre of the fixed vessel, and had a variety of tubes arranged round its circumference. The tubes did not reach to the very top of the vessel, and were bent into right angles at their lower ends. The water from the upper and fixed vessel being delivered into the tubes of the lower vessel descended in the tubes, and issuing from their horizontal extremities gave motion to the conical drum by its reaction. "It appears that this is the most powerful of all hydraulic machines." Euler published his theory of the machine in *Mémoires* of the Berlin Academy, vi. 311. The perfection of the turbine, from this simple experimental form, is a matter within the cognisance of modern engineering.

CHAPTER IV.

THE ROMAN MILL (VERTICAL TYPE).

IV. THE ROMAN MILL.

1. Its Introduction.

1. THE primitive Greek (or Norse) mill was first mentioned, it will be remembered, about the year 85 B.C. For a period of one hundred years it remained the sole power-mill of the world. During this time, there can be no doubt, the Romans gained a full knowledge of the nature of the novel contrivance, possibly from Cabira in Pontus, itself, where, among the treasures of the defeated Mithridates, was the water-mill of his palace. It may very probably be thus from a Roman source that were derived the watermills which Pliny, in a passage already quoted, informs us were used in his day through a great part of rural Italy. With the simple mechanism of the Greek mill the Romans did not, however, long remain content. There is indeed no evidence that the State ever utilised the Greek watermill in preference to the slave and the cattle mill; and it certainly would not be at the instance of the civic fathers, nor of yet the general body of pistores of the city, that the attempt was eventually made to improve upon its rude principle of construction and limited practical efficiency. The invention of a mill that was ultimately destined to entirely supersede the original motor and to remain the model watermill of the world, is no doubt to be credited to some Roman *savant*, most probably the engineer, Vitruvius, who first described it. The characteristic features of this mill are comprised in its vertical water-wheel and its cog-gearing, contrast-

Text: II. iii.

IV. THE ROMAN MILL.

ing with the distinguishing horizontal wheel and lack of gearing in the Greek mill.

2. Of Vitruvius.

2. It was between the years 20 and 11 B.C. that Vitruvius described the new watermill. In his comprehensive treatise, entitled *Architecture*, this great authority specified the most notable or novel engineering contrivances of his day, observing: "There are innumerable machines of which it is unnecessary to discourse, because they are daily at hand, such as the bellows, the wheel (rotæ), the carriage (rhedæ), and others in ordinary use; and we shall therefore explain only those which rarely come to hand, in order that they also may be known." It is noticeable that he does not describe the Greek watermill, and the inference is that it was therefore well known, if not ordinarily used in Rome. As he does, on the other hand, describe the mill now characterised as "the Roman watermill," this, consequently, was a new machine, probably invented by himself.

Vit.: Newton, 1791, X. 1.

Before Vitruvius refers to the cornmill he gives a specification of certain wheels used for raising water. One of these is a vertical wheel, with buckets on its circumference, above its summit being a slight staging upon which men stand and force round, by the action of their feet, the wheel and the water it carries. Such a wheel seems to be the origin of the modern treadmill. The most important and interesting irrigation water-wheel, however, is that which he describes as being turned by the force of the stream: "Around its front are fixed vanes which, being impelled by the current, force the wheel round, so that the buckets raise the water without the operation of the treading of men, the impulse of the river itself performing the whole work." This wheel, we must presume, was a contrivance that was little known, though it cannot have been quite a novelty, as some few years before Vitruvius wrote the above we find Lucretius speak-

Text: I. 225.

Vit.: Newton, x. 9.

ing of wheels and hydraulic apparatus which streams turn round :—

IV. THE ROMAN MILL.

2. Of Vitruvius.

Ut fluvios versare rotus atque haustra videmus.[1]

However, from this starting-point Vitruvius proceeds to give the specification of the new Roman vertical water-wheel :—

[1] De Rer. Nat.: v. 517.

Eadem ratione etiam versantur hydraulæ in quibus eadam sunt omnia, præterquam quod in uno capite axis habent tympanum dentatum et inclusum; id autem ad perpendiculum collocatum in cultrum, versatur cum rota pariter. Secundum id tympanum maius item dentatum planum est collocatum, quo continetur axis, habens in summo capite subscudum ferream qua mola continetur. Ita dentes ejus tympani, quod est in axe inclusum, impellendo dentes tympani plani, cogunt fieri molarum circinationem, in qua machina impendens infundibulum, subministrat molis frumentum et eadem versatione subigitur farina.

De Architectura : Venice, 1567, x. 10.

By the same means [the current] are turned the hydraulic contrivances in which all the parts [of the water-wheel] are the same,

The Mill of Vitruvius.

except that on one end of the axis C is a toothed tympanum or drum B, with a pin for bolting it to the axis. This tympanum is set perpendicularly on edge, and is turned equally with the water-

IV. THE ROMAN MILL.

2. Of Vitruvius.

wheel. Connected with this tympanum is a larger one, D, toothed and placed horizontally, and containing an axis E, at the top of which is an iron mortice F, which is inserted in the millstone marked *. Thus the teeth of the tympanum B, which is bolted on to the axis C, impel the teeth of the horizontal tympanum D, and effect the rotation of the mill, the suspended hopper above supplying the grain to the stones, and the rotation of the latter ejecting the flour.

The lettered diagram is that of Newton, the young architect and artist, whose translation of Vitruvius is undoubtedly the best in the language. In one or two matters we have, however, been compelled to deviate from his rendering of the text of the specification. First, Newton states that the dovetail of the spindle F was fixed in the lower stone instead of in the upper stone, marked * ; as it appears in his drawing. It is true that Vitruvius merely remarks that the spindle and dovetail were fixed to the mill ; but it is obvious that they drove the upper, and not the lower stone, the action being merely that of the quern, upon the principle of which the watermill was evidently based. Again, with reference to the pinion wheel B, Newton and others say it is "included" in the axis. This is clearly incorrect, and the word "inclusum," used by Vitruvius, may more reasonably be understood to indicate that the pinion B was keyed, bolted, or spiked upon its shaft, as it necessarily would have to be. These are but trifling errors of Newton, who evidences throughout a worthy reverence for literally translating his author.

Certain other editors are chargeable with considerable indiscretion in boldly altering the text of the original to obviate difficulties and meet their own views. For example, it is evident from the relative sizes of the wheel and pinions B and D that the millstone would revolve considerably slower than the water-wheel. Vitruvius, therefore, probably contemplated the use of the mill on strong, rapid rivers, such as the Tiber. For use on slower streams the

2. Of Vitruvius.

relative sizes of the cog-wheels might be altered, so that the mill, instead of running slower; would run as fast, or even faster, than a sluggish stream, as in the modern mill figured on page 36. Though all this seems perfectly evident, some critics have chosen to consider his arrangement of the relative sizes of the cog-wheels as an error, and have corrected it by making the pinion-wheel B larger than the cog-wheel D.

Medieval Roman Mill.

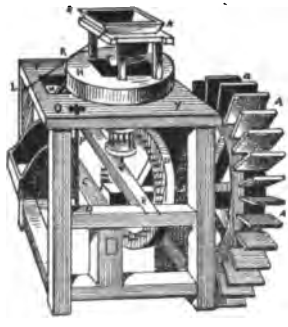
Perrault, in an edition of 1673, followed by Galiani in his edition of 1758, have done this, remarking that Vitruvius's arrangement would be "contrary to the present practice." Newton wisely protests against such mutilation of the text, though he scarcely seems to perceive the precise point upon which his argument ought to turn: "All the MSS. I have examined,

IV. THE ROMAN MILL.

2. Of Vitruvius.

as well as other printed editions, agree in having 'magnus,' and not 'minus' [with respect to the tympanum D]; and we ought to be cautious of altering the text in passages where all the copies agree, the rather as the ancient mill may have differed from the modern ones in this respect, and yet have performed their office as well." Perrault and others have also converted the pinion-wheel B into a spindle-box, as shown in the foregoing illustration, copied from the Venetian edition of 1567; merely because such a basket spindle-box was found in the mills of their own day.

This was the mill eminently adapted to the Tiber, which for nearly four centuries the Romans declined to use; which, on the conversion of Pagan Rome to Christianity, fully compensated the city for the abolition of slave labour at the State mills; and which remained the standard model whence, till modern times, were developed all future milling improvements. As La Mare worthily remarks, it remains, at the present day, "a monument to the rare genius of Vitruvius, who, as we may be well assured, devised it." Its close identity with the well-known watermill of modern times may readily be perceived, this mill only differing essentially from that of Vitruvius in the detail, above spoken of, as to speed of working.



Modern Mill: Roman Type.

3. Its Adoption.

3. Though Vitruvius described his mill at about 20 B.C., it is not till the year A.D. 398 that any evidence of its use occurs. At that period the introduction of Christianity and abolition of slavery had of course greatly reduced milling facilities, and concurrently with this diminution in grinding resources arose a demand for free meal for the citizens

Text: I. 192.

IV. TH ROMAN MILL.

3. Its Adoption.

greater than had ever before been experienced by the State. These two circumstances together appear to have pressed rapidly forward the long-delayed adoption of the watermill. In 398 an edict of Honorius and Arcadius (quoted later) stringently enforced the protection of watermills in terms suggesting that the latter were but newly established. Whoso should be so "impudent," it declared, as to dare to appropriate any water driving the mills which supplied the venerable institution of State-supplied food to the city, should be fined five pounds in gold; and any city officials knowingly permitting anything of the kind, should be severely punished.

At this period thus practically commenced, therefore, the great initial revolution in the world's corn-milling. Yet contemporary writers seem to have thought it not worth a chronicling word; no historian, geographer, politician, or philosopher, no poet (like Antipater, who so happily eulogised the invention of the little vertical mill of Greece) deemed the great industrial event of the age worthy of the slightest notice; and the only undoubted evidence we possess, that at this date watermills existed at all, is to be found in the bare law issued for their protection. And if we cannot avoid observing the indifference of the ancients on the matter, it is scarcely possible to overlook the utter silence of the moderns, who also, as with one mind, totally ignore the peaceful revolution that substituted natural forces for human labour, and in the end vastly cheapened the bread of the world. To revert for a moment to the first watermill, that which, as Strabo states, was found near the palace of Mithridates of Pontus in 65 B.C., this definite and prominent certainty among ancient myths and fables the historian Hooke passes over in silence. The looting of the cities of Pontus is fully described by him, and we are told that so numerous were the

Roman Hist., Bk. viii. c. viii.

IV. THE ROMAN MILL.

3. Its Adoption.

Decline and Fall, V. xxxi.

treasures, that Pompey's questor occupied thirty days in making an inventory of them; yet not a word refers to the greatest treasure of them all, and the only one which has remained to the world. Coming to later times, Gibbon, the voluminous chronicler of the minutiæ of Roman history, stops in the course of his history at this precise period of the reign of Honorius and Arcadius to survey the topography and resources of the city and the condition of the people. Temples, mansions, houses, streets, stupendous aqueducts, granaries, grain supply, and free distribution of bread, are all graphically described, but the birth of the Roman corn-mill is utterly forgotten; the cluster of watermills beneath Janiculum is unmentioned, and the accomplishment of a reform—that has wrought greater changes than the conquests of a Cæsar, and affected the well-being of vaster populations than the mind of an Alexander surveying the earth could conceive—is not even suggested.

4. At Janiculum.

Text: I. 194.

Theo. Code. Comment.: Gothofred.

Aquis et aquibus Vet. Rom.: Fabretti, 1680, 176.

4. It will be remembered that during the period of slave and cattle labour the mills were scattered all over the city. About the year 370 Sextus, in his topography of Rome, seems to have enumerated about 300 mills in the various wards of the city. Most of these would be penal and cattle mills, or private establishments, with bakeries and shops attached. But about the year 398 we have seen that watermills were coming into use, and these of course were necessarily settled near the water supply. Much doubt exists among writers as to the source of this supply, some considering that the mills were driven from the overflow of the fountains in the streets, other conjecturing that canals from the Tiber afforded the necessary power. The cause of the confusion and of the speculation to which it gave rise, must be considered to lie in the idea that the watermills were scattered through the city, which does not seem to have been the case.

IV. THE ROMAN MILL.

4. At Janiculum.

The source of supply appears to have been the old aqueduct of Trajan, bringing water from Lake Sabbatina, a distance of twenty-two miles, to Mount Janiculum, across the Tiber. Thereon had stood the temple of Janus; and thus this famous spot, in Pagan days shrine of the two-visaged god who smiled for peace and frowned for war, became in Christian times a centre for the placid art of corn grinding. The hill of Janiculum seems to have been constituted the milling centre of Rome, because of some reason which commended itself to the authorities for devoting the water of the Trajan aqueduct to the purpose. Possibly it was considered desirable to congregate the mills in one spot, and no other was so convenient as that across the Tiber, outside the crowded streets of the city: possibly it was held preferable to devote wholly or partly one aqueduct to driving mills instead of permitting water to be drawn for the purpose at random from aqueducts in the principal parts of the city: possibly the water of Trajan's aqueduct had come to be considered unsuitable as a fresh-water supply. In any case, the expedient appears to have been adopted. Certainly convenient rivulets or streams were lacking, and there seems to have been anticipated a difficulty of working regularly and safely on the Tiber; so that the water supplying mills which the law of 398 ordered should not be diverted or improperly tapped, appears to have been the water of the Trajan aqueduct.

See also De arb. & palo. mol.: Biler: 1730.

Various evidences appear of the localisation of the mills at Janiculum. Prudentius, about the year 390, incidentally mentions the watermills of Janiculum:—

Quæ regio gradibus vacuis jejunia dira sustinet? aut quæ Janiculi molæ mota quiescit?

What quarter of the city can endure the dire famine, the gradus* being empty? or what, the motion of the mills of Janiculum being stopped?

Prud. ad Symm.: II. 948.

* Gradus, primarily meaning a step, was the term given to the platform whence was distributed the free public bread supply in Rome.

IV. THE ROMAN MILL.

Procopius, writing at about 550, tells us that all the watermills of Rome were at Janiculum :—

4. At Janiculum.

> This is a region across the Tiber where rise several tolerable hills, and where now, as in former times, are erected *all* the mills; a large body of water being conveyed by timber structures, direct from the top of the hills, and the water falling down the slope with considerable force.

Belli Gothicorum, i. 19.

> Ibique omnes moletrinæ iam inde olim extructæ sunt: quippe magna aquæ vis per alneum structilem ad collis verticem deducta inde vehementi cum impetu in declive labitur.

As Janiculum is a very inconsiderable hill, and could never have possessed natural streams of sufficient force to drive many mills, the water conveyed from its summit by troughs must be understood to be that drawn from the aqueduct of Trajan.

De Vit. Pontif. Rom.: Paris, 1649, 46.

As late as about the year 650, Pope Honorius I. is stated not only to have built churches and beautified the sacred shrines of Rome, but to have erected mills within the walls of the Place of Trajan beside the wall of the city, and the aqueduct conveying water from Lake Sabbatina :—

> Et ibi constituit molas in murum in loca Trajani juxta murum civitatis et formam quæ deducit aquam in lacum Sabbaticium.

No relics of the mills on the slopes of the hill seem to have ever been discovered, unless, mayhap, the inscribed tablet, which certainly had been affixed to some mill, be considered to have come from the locality. Long ago the district lost its ancient distinctive character, and "there remain now few relics of antiquity in Janiculum, that part of the city being given up to various of the common people who have long been settled there."

Text: I. 193.

Topog. Rom.: Boissard, 1627.

5. Laws Affecting.

5. The Justinian Code issued in the year 538 contains several enactments having reference to the mills, none of these laws, however, indicating precisely where they were situated, but all agreeing with the presumption suggested, that the principal part of them, if not all, were at Janiculum. The earliest of these laws is that of Honorius and Arca-

IV. THE ROMAN MILL.

5. Laws Affecting.

dius, issued in the year 398, to which allusion has already been made:—

Improborum petitiones, qui impudentius aussi sunt postulare pensiones aquæ molarum quæ Urbi venerabili annonas abundantius præstitissent, quinque librarum auri mulcta infligat, nisi ab hac petendi importunitate discedant. Illos etiam qui potestati præfecturæ annonariæ præsunt et apparitores qui hisdem ministeriis obsecundant, par multa retineat si cuiusquam improbissimi hominis consenserint, vel paruerint, voluntati. Codex Theod.: Gothofred: 1736: v. 267.

If any one be so daring as to draw off the water which serves the mills employed for the purpose of supplying the city with abundant bread, he shall be fined five pounds in gold, unless he immediately desist from the same. Any magistrates holding office as prefects of the food supply, or any officers serving under them, consenting to or conniving at any such, these most dishonest persons shall be amenable to the same penalty.

An enactment of Zeno about the year 485, confirmed in the Justinian Code of 538, prohibits the use of the public water supply for mill driving; apparently with the view of preventing diversions to private mills from the fresh-water supplies in the aqueducts within the city proper on the east of the Tiber:—

Quod antiquis etiam constitutionibus interdictum esse dignoscitur: scientibus universis, quod in posterum super hujusmodi commissis, suburbanum vel prædium, vel balneum, vel aquæ molæ, vel hortus, ad cujus usum aqua publica fuerit derivata, vel si quid ex his juxta aquæductum positum ad eum pertinet, qui plantavit arbores aquæductibus noxias, ad quemcunque pertineat locum, vel hominem, vel domum, proscriptionis titulo subjacebit, et fisci juribus vindicetur. Code Just., xi. 42, 10.

A thing which it is obvious was forbidden by the old imperial regulations, and which, as every one knows, has been decreed for the future about such matters:—That any suburban farm, bath, watermill, or garden, for the service of which the public water has been drawn off; or any of these placed near an aqueduct and having trees planted injurious to the aqueducts, then to whatsoever place, man, or house it may belong, it shall be liable to confiscation, and may rightly be claimed by the imperial Treasury.

Other laws indicate that mills might legally be built upon streams and rivers. Among the Pandects of Justinian, issued in 530, we find:—

Fluminum publicorum communis est usus, sicuti viarum publicarum et litorum. In his igitur publice licet quilibet ædificare et destruire; dum tamen hoc sine incommodo cujusquam fiat. Digestorum, xxxix. 2, 24.

Of public streams the use is common, just as is that of public

IV. THE ROMAN MILL.

roads and the seashore; hence it is lawful, upon them, for any one to erect or pull down again any thing, provided no inconvenience to others be caused thereby.

5. Laws Affecting.

Ibid., xliij., 12, 12.

Hoc interdictum ad ea tantum flumina publica pertinet quæ sunt navigabilia; ad cætera non pertinet.

This interdict refers to public streams that are navigable, not to others.

If mills may be considered as buildings, then it is clear the law provided for their erection on non-navigable streams.

The laws of the Ostrogoths, under Theodoric of the West, were generally framed on the model of the ancient laws of Rome; and among the enactments of about the period 493–526 are found once more laws protecting the mill, and prohibiting the misuse of the ordinary fresh-water supply :—

Cassiod. Operæ, 1650, 104.

Dicitur commodi cura privati aquam formarum, quam summa deceret studio communiri ad aquæ molas exercendas vel hortos irrigandos fuisse derivatam, turpe hoc et miserabile in illa urbe fieri quod per agros nix deceret assumi.

It is said that through concern for private interests the water of the public conduits, which ought to be guarded with the utmost care, has been drawn off for the working of watermills or the irrigation of gardens; a disgraceful and lamentable thing to be done for the city, a thing which it would scarcely be right to do for the cornfields.

Leg. Visigoth.: Lindenbrogius, 1613, viii. 4.

De confringentibus molina et conclusiones aquarum. Si quis molina violenter effregerit quod fregit intra triginta dies reparare cogatur; eadem et de stagnis quæ sunt circa molina, conclusiones aquarum, præcipimus custodire.

Of the fracture of mills and water-sluices. Any one violently injuring a mill shall repair the injury within thirty days; and the same with regard to pools and sluices attached to mills, the due protection of which we order.

Leg. Visigoth., vii. 12.

Si quis de molinis aliquid involeraverit, quod furatum est, restituat, et in super componat sicut de aliis furtis lege tenetur, et extra hoc centum flagella suscipiat.

Whoever shall break into and steal anything from a mill shall make restitution of the same, shall also answer to the law as for any other theft, and shall further receive one hundred lashes.

CHAPTER V.

COLLEGIUM PISTORUM.

V. COLLEGIUM PISTORUM

1. Memorial to Antoninus.

1. As already suggested, the adoption of water-milling followed very closely upon the reconstitution of the old College of Pistors, and the issue of a series of new regulations controlling the college and the craft. Since the time when Trajan founded the company (A.D. 98–117), various causes had increased the public importance of the status of the trade. The old system of slave labour had given place to the employment of freemen who voluntarily pursued the avocation of milling and baking; properly qualified journeymen and legally articled apprentices were required; outsiders enjoying neither the franchise of the city nor that of the company needed excluding from the trade; watermills were coming into steady use, and milling engineering becoming an allied craft; while mills owned by private persons and grinding on hire were gradually increasing in number. Such a series of changes indicates the rapidly developing public importance of the trade of the pistors and of their company. Within thirty years after the death of Trajan the college seems to have received some favour from Antoninus Pius, in honour of whom it erected in the year 144 a memorial, chiefly interesting at the present day as a memento of the settled and recognised status the incorporation had so soon after its foundation attained. The memorial has been described as erected in honour of Hadrian,* but an

Text: I. 208

Text: I. 209.

* Quant au monument d'Hadrien, il fut élevé à la mémoire de cet empereur, 206 ans après sa mort, par le collège des pistores. Ce choix d'un César païen, près d'un demi-siècle après le triomphe de Constantin, montre qu' Adrien avait accordé à cette profession des faveurs dont l'histoire ne parle pas, mais dont deux siècles et le nouveau régime n'avaient pas effacé le gratitude. La Meule de Moulin: Angers: 1895: 34.

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inscription upon the marble is now found to prove this impression a fallacy.

1. Memorial to Antoninus.

Corp. Inscrip.: Gruterus, cclv.

IMP. CÆSARI DIVI.
TRAIANI. HADRIANI. FIL.
DIVI. TRAIANI. PARTHICI. NEP.
DIVI. NERVÆ. PRONEP.
T. ÆLIO. HADRIANO.
ANTONINO. AUG. PIO.
PONT. MAX. TRIB. POTEST. VII.
IMP. II. COS. III. P.P.
CORPUS
PISTORUM.

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1. Memorial to Antoninus.

TO TITUS ÆLIUS HADRIANUS ANTONINUS AUGUSTUS PIUS, PONTIFEX MAXIMUS, SEVEN TIMES [INVESTED WITH] TRIBUNICIAN POWER, TWICE SALUTED IMPERATOR, THRICE CONSUL, FATHER OF HIS COUNTRY; SON OF THE DEIFIED EMPEROR CÆSAR TRAJANUS HADRIANUS; GRANDSON OF THE DEIFIED TRAJANUS PARTHICUS; GREAT-GRANDSON OF THE DEIFIED NERVA

THE COLLEGE OF PISTORS
[ERECT THIS TABLET].

As Antoninus Pius was twenty-three times invested with the "Potestas Tribunicia," the last being in the year of his death, A.D. 161, the inscription dates from an early period of his reign. According to Professor Cagnat, the year in which, for the seventh time, the emperor was invested with the dignity and power in question was A.D. 144, and this is therefore the date of the erection of the memorial. Carved upon one side of the marble a measure filled with grain in the ear, and upon the other a grooved millstone, appropriately typifying the craft, surmount the respective inscriptions :—

PRAEF.
L. VALERI. PROCOLI.

CVRANTIBUS
M. CÆRET . . . MARAGDO
L. MÆVIO. EPICTETO . . . GVING II.
QUÆSTORIBUS
C. PVPIO . . . FIRMINO II.
C. CALPVRNIO. MAXIMO.

Valerius, whose name first appears, was Prefect of Rome in the year 351, and presumably therefore the monument was restored—not originally erected, as has been thought—in that year.

2. Laws.

2. Within half a century of the restoration of the memorial, the company comes prominently into view in the laws of Rome, the Theodosian Code containing various interesting enactments regulating the status of members, controlling their conduct, and governing the management of the company. The code was framed by Theodosius II. in the year 438, and

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being intended by him to confirm the laws of the Christian emperors from Constantine to his own reign, contains the enactments of these several princes under their original date of issue. But before citing them, their general character and scope may advantageously be explained by the concise summary of their purport, compiled by the French economic writer La Mare, early in the last century.

Traité : 1710, liv. v., tit. xii. c. 1.

Aurelius Victor et l. 1, cunctis ; l. 2, si quis; l. 14, si cui.

A college was formed, to which those in the trade were necessarily attached, without power of quitting it under any pretence whatever. Their sons were not free to quit it to take up other trades, and those who married their daughters were constrained to follow the same profession.

l. 18, cum de lanionis; l. 4, improborum, c. th. de canon frument. urb. Rom.

The college was put in possession of all the places which up to then had served for grinding grain, and everything which had been employed by the State for that purpose. Other properties were added, comprising lands and heritages, in Rome and the provinces, from which might be derived a revenue to keep the mills in good condition.

l. 3, quicumque ; l. 5, leviorum ; l. 12, secundum, ibid. ; l. 17, Judices, c. th. ibid.

The State continued to condemn to the pistrina all those who were convicted of minor offences ; and in order that the number of such workers might not fail, the Judges of Africa were directed to send every five years to Rome all those who had been condemned to that penalty, to be employed in the service of the capital.

l. 7, post quinquenarii, c. th. ; l. si quis, c. th. ibid. ; l. 7, post quinquenarii, c. th. ibid. ; l. 3. pistoribus urbis.

There was in each pistrinum a premier patron, who had the superintendence of the servants, slaves, animals, mills, ovens, all utensils, seeing that the same were kept in good condition, and that every one employed there did his duty properly. These patrons met before the magistrates, and chose one among them to have the inspection and superintendence over the others, under the title of *Prefect*. He was charged with the affairs of the college, was treasurer of the common fund, and at the end of his administration rendered account of the same. Such an official remained in office five years.

l. 1, cunctis, c. th. de pistor ; l. 4, prædia, c. th. ibid. ; l. 13, non ea sola, c. th. ibid.

It was prohibited to all those who composed the college to dispose of by sale, gift, or otherwise the goods which belonged to them in common, and which had been given to them originally at the foundation of their college, and which were called for that reason the common fund. It was also prohibited to them to dispose of any of the goods which they had gained in their trade, or which had been inherited from their parents in the same trade. Nor could they give these same goods privately or by will, except to their children, sons-in-law, or nephews, since these also would become pistors. Whoever, of whatever station he might be, bought or acquired by any title any portion of such goods from pistors, would remain amenable to the college, and meet all demands in reparation. Pistors could dispose of goods which had come to them otherwise

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than as part of their trade or which had been inherited from their parents, but if this were not done personally before death, the goods appertained to the college. It was not permitted to magistrates, officers, or senators to purchase goods belonging to pistors, and of which they had the full disposition for the profit of other persons.

As soon as a son was born to a pistor the infant was reputed a member of the college, and was counted with the rest; but until he was twenty-one years of age he was not obliged to work at the trade, and the commonalty was bound to maintain, up to that time, a man in his place, so that the complement of members should be always full. l. 5, filios, c. th. ibid.

It was prohibited to magistrates to permit any pistor to quit the trade or dispose of his inalienable goods, even if he had obtained letters from the Prince according him that permission, and if even the college agreed. They were also prohibited soliciting his discharge under pain of a fine of five pounds in gold, payable to the treasury, and all judges were prohibited pronouncing his discharge, under pain of a fine of two pounds in gold. But this referred only to pistors by birth or who had joined the college, for those persons who had been condemned to penal labour at the mills might be discharged by favour of the Prince, or by decision of a magistrate on hearing their cause. l. 6, nulli licet, c. th. ibid.; l. 7, nullum, c. th. de pistor et Gothofred, ibid.; l. 8, in speculis c. th. cod. titul. et ibid. Gothofred.

It was considered so important to maintain always a sufficient number of pistors for the public service, that in addition to all the precautions just explained an express law added to them that it was not permitted to any pistor to withdraw himself from his trade and enter the church as a cleric, and if he had done so, he should be obliged to return to his employment. l. 11, hac sanctione.

Pistors could not be discharged from their trade in order to join the army, even if they had obtained letters from the Prince. l. 18, ut concessa, c. th. ibid.

They were not, however, totally denied attaining to the honours of the republic. Some of their number, who had served the State with great zeal, principally in times of dearth, were from time to time elevated to the dignity of senators. Still it was ordered that after being nominated they should have the option either to accept the honour—in which case they had to abandon their trade and all the goods they possessed as pistors to another who should take up the trade—or else to renounce the dignity and remain at business. The rank of senator was the highest to which a pistor could attain. It was prohibited to elevate them to the magistracy or to any other high dignity to which was attached the title "Perfectissimatus." l. 4, optio. l., unica codicilis, c. th. de perfectissimatus dignitate.

Great as was the care taken to preserve the aggregate number of the pistors, no less was observed to maintain their personal probity and honour. It was in this view decreed that they should not ally themselves in marriage with comedians or gladiators, under pain of flogging, banishment, and confiscation of their goods to the benefit of the community. Any officer or magistrate having facilitated such union was amenable to a fine of ten pounds. For the same reason, another law enacted that any pistor who had dissipated all his goods should be expelled from the college as a bankrupt, l. 21, nulli pistori, c. th. ibid. l. 15, ne quis, ibid.

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and should not be allowed to re-enter, it being to the public interest, adds this law, so to deal with such discreditable people.

Among the pistors, certain freemen who had been appointed specially to make the bread for the table of the Prince had aspired to the post of superintendents of public granaries, a position for which, because of their trade connection with other pistors, they were considered unsuitable. The Emperor Leo issued, therefore, a law decreeing that whoso of the pistors of the palace should obtain by ambition, grace, money, or otherwise, the post of superintendent of a public granary, should be removed therefrom, condemned to a fine of twenty pounds in gold, and sent back to his employment.

l. unica, quicumque, c. de pistori et ibid. glossa.

After having established the college, assured the number of members, and regulated their fortune; after having encouraged the pistors to serve the State well by the hope of attaining public honours, and taken precaution against the corruption of their morals, nothing more was wanted than to regulate their employment, and this was also provided for.

Each pistor, as has been said, had a pistrinum or place of business, and for public convenience these were distributed through the wards of the city, pistors being forbidden to leave one and go to another without due permission. All the grain from the public granaries was distributed to the pistors at their places of business. They paid nothing for a certain quantity, which they had to make into bread for free distribution to the people. As to the rest, they paid the price decided by the magistrate on a basis which would fix the price of the bread to be sold. As all this grain belonged to the State, the greater part of it being the tribute imposed on the provinces, it was easy to make this fixed price. What grain came afterwards into the market was theirs, always sold at a fair rate. It was very stringently prohibited to sell or deliver any grain from the public granaries to any other persons than the pistors, not even for the house of the Prince, except for his own person and table.

l. 2, nulli, c. th. de frument, urbis Constantinopolitan, Gothofred ibid.

After grain from the public granaries had been delivered to the pistors, the latter stored it in their own private granaries, whence they drew it as required for use. All persons were forbidden diverting this grain to other uses than those already specified, under a penalty of five pounds in gold; and the pistors were ordered to render due account to the magistrates of all such grain received by them. It had indeed occurred that the officers of the Prefect, in order to extort money from the pistors, had delivered grain false in measure and bad in quality to those who gave them no bribe, but the offenders being discovered, were committed to the mills for life.

l. 4, improborum, c. th. de canonfrument, urb.; c. 16, quid quid, c. th. de pistor; l. 22, quicumque, c. th. ibid.

In order that a full and constant supply of bread should be provided for the citizens, the pistors were rendered exempt from wardship, trusteeship, or other civil duties likely to distract them from their employment. For the same reason there was never for them any suspension of the sittings of the law-courts, so that during vacations, when the tribunals were closed to all other persons, the pistors partook with the Treasury the privilege of being admitted for

l. 46, qui in collegio; l. 5, publicus.

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the decision of disputes in their affairs, the law making evident by this concession that the interest of the public was as dear to it as that of the Prince.

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As the delivery of grain to the pistors was made by the boatmen of the Tiber and the sworn measurers who had charge of it, one and the other of these tradesmen were held to be unsuitable as pistors or as partners of pistors. There was a body of grain porters, saccarii, or sackmen, whose business it was to transport the grain from the port, Ostia, to Rome, and place it in the public granaries. Another body of porters, termed Catabolences, was maintained by the State to transfer the grain from the public to the private granaries of the pistors, and to carry out the bread for free distribution to the citizens. These porters were usually chosen from the freemen, and certain of them were required to enter the company of pistors, provided they had heritages or goods worth thirty pounds in silver.

l. 1, naviculario s, c. th. de naviculario s.

l. 9, ex libertinis, c. th. de pistor . et catabol ;

l. 10, libertini, c. th. cod. titul. et ibid Gothofred.

The various enactments themselves rarely appear in expositions upon Roman Law, or indeed in professed compilations of the edicts of the emperors; of so slight an importance have they generally been deemed by students of Roman Jurisprudence. Our extracts are taken from the voluminous Theodosian Code of Gothofred, issued over a century and a half ago, and still the standard authority upon the intricacies of the ancient text.

Codex Theod. Gothofred : Leipsic, 1736 : lib. xiv., tit. iij.

LEX I.—Promulgated by Constantine, 13th August 319:—

Cunctis pistoribus intimari oportet, quod si quis forte possessiones suas ideo putaverit in alios transferendas, ut postea se, rebus in abdito conlocatis, minus idoneum adseveret, tanquam in locum eius alio subrogando, nihil ei hæc astutia nec detestabilia commenta pro futura sunt, sed in obsequio pistrini sine ulla excusatione durabit, nec ad eius jura revocabuntur, si quas emptiones transcriberit.

It is proper that it be notified to all members of the Corporation of the Pistors, that if any one of them shall chance to deem it proper to make over his property to others, with the design that, when the goods have been put away into concealment, he may thereafter maintain he is insufficient (for his position), so that therefore another ought to be substituted in his place,[1] his craft and abominable scheming shall profit him nothing, but he shall remain amenable to the duties of his pistrinum without any excuse. And if he have sold any of his purchasings,[2] they shall not be restored to his power.

[1] Gothofred explains that in the time of Constantine a pistor might sell his private property in ordinary circumstances (cf. *infra*, Lex III.). But if the transaction was a mere device to render him apparently unfit to sustain the burden of his trade, it was to be rendered futile. So too, real destitution might

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warrant discharge; but abuse of this is here guarded against, as also in Lex XIV. *infra*.

[2] Of which he might legally dispose. Hence an innocent purchaser was not to be liable to make restitution.

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LEX II.—Promulgated by Constantius, 6th July 355[1]:—

Si quis pistoris filiam, suo conjugio crediderit esse sociandam, pistrini consortio teneatur obnoxius, sed familiæ pistoris adnexus, oneribus etiam parere cogatur. Et quoniam necessarium corpus favendum est, Patronos Pistoribus constitutos ad altera functionis officia prohibeo devocare, Caudicariorum corpori minime decetero copulandos; ut aliis necessitatibus absoluti eam tantummodo functionem liberæ mentis nisibus exsequantur.

If one shall make up his mind that the daughter of a pistor is to be united with him in wedlock, let him become liable to the lot of the bakehouse. Being admitted to the family, let him be compelled also to undertake the duties of a pistor.[2]

And since it is necessary[3] that this Guild (*i.e.* the Pistorian) should be fostered, I forbid that the patrons who have been appointed to the milling fraternity be called away to other official duties, and especially that they be connected with the Guild of the Navigators of the Tiber.[4] I do so in order that, being freed from other claims, they may attend to this function only, with all the energies of a free mind.

[1] This Law consists of two quite independent sections—the one relating to the marriage of the daughters of pistors, the other directed to securing efficient performance of their duties on the part of the patrons or elective officers in superintendence of the *Pistrina*. (As to these *cf.* Lex VII. *infra*.)

[2] *cf.* also Lex XIV. *infra*.

[3] *i.e.* for the city food supply.

[4] These manned the grain-ships, and were thus of a Guild allied with that of the Pistors. Various examples of men holding office in more than one corporation are given by Gothofred.

LEX III.—Promulgated by Valentinian and Valens, 2nd June 364:—

Prædia rustica vel urbana quæ possident privato jure pistores nec senatorem nec officialem comparare permittimus (contractu pari cum aliis non interdicto). Quippe mercantes ad venditoris officium vocabuntur, super hac emptione apud P. F. Ann. testatione deposita. In donationibus vero filii excepti sunt et nepotes. Eodem loco positis omnibus qui qualibet proximitate junguntur, quibus ideo non dempsimus beneficium largitatis, quia et paneficii necessitatem suscipere successionis jure coguntur. Hæc forma servabiter et in testamentis aut donatione vel novissima voluntate ut in extraneos conlata non valeant, nisi pistoris officium sponte susceperint, qui pistorum sunt munificentiam consecuti.

We do not permit senators or officials[1] to acquire lands either in town or country which are owned in private right[2] by pistors (fair contract with others not being, however, forbidden). But they, forsooth, if they purchase, are subjected to the duties of the sellers, on a record of the sale being deposited with the Inspector-General of the Public Food Supply.[3] In regard to

donation, children and grandchildren occupy an exceptional position, in which, too, we place all who are related in any degree; these we do not deprive of the privilege of taking a gift, because they are compelled to subject themselves to the lot of breadmaking by the very operation of the law of inheritance. This rule is observed, too, in testamentary disposition, by gift or by last will, that provisions conceived in favour of strangers shall be of no avail unless those who have so obtained the bounty of pistors shall themselves freely undertake the pistorian duty.

[1] The object of this prohibition seems to have been to prevent undue pressure by those classes to enter into transactions.
[2] *i.e.* as distinguished from proper guild lands, which were inalienable.
[3] This functionary [Præfectus Annonæ] was first created as a permanent official by Augustus, being originally chosen from the Equestrian order. (*Cf.* Ramsay's Roman Antiquities, p. 235.)

LEX IV.—Promulgated by Valentinian and Valens, 6th June 364:—

Optio concessa est his, qui e pistoribus facti sunt senatores, ut aut studio facultatum aut splendidissimo ordine segregati sint. Quod si fuerint cupidi dignitatis, in tantam paneficii substantiam idoneos de suis subrogare cogantur, quantam ipsi exhibuere pistoris.

To those who from among the pistors have been made senators,[1] the choice is given that they sever themselves either from their attachment to their possessions or from this most illustrious order.[2] Moreover, if they are desirous of the rank, they must find substitutes from among their own folk capable of making as great a quantity of bread as they themselves while pistors produced.

[1] Generally as a reward for services rendered to the State, *e.g.* in times of scarcity.
[2] *i.e.* they could not remain pistores and enjoy senatorial rank. If they chose the latter their property as pistors fell to the Guild.

LEX V.—Promulgated by Valentinian and Valens, 8th January (or, more probably, June) 364:—

Filios pistorum qui in parvula ætate relinquuntur, usque ad vicesimum annum ætatis a pistrini sollicitudine defendi jubemus. Sane, periculo totius corporis subrogari convenit pistores idoneos pro pupillis; sub hac videlicet condicione, ut post emensum vicesimum annum ætatis paterni muneris necessitatem subire cogantur; nihilominus permanentibus pistoribus his, quos in locum eorum constat substitutos.

It is our will that sons of pistors who are bereft of their parents while of tender years be excused from the toil of the pistrinum even to the twentieth year of their age. It is fitting, indeed, that suitable pistors be found as substitutes for such pupils at the charge of the whole Corporation—under this proviso, however, that after the completion of their twentieth year they be compelled to submit to the lot of their paternal

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avocation—those nevertheless still remaining pistors who have been found as substitutes for them.[1]

[1] Gothofred pertinently observes on the singularity of this regulation, which holds the substitutes bound after the temporary cause of their substitution has ceased to operate.

LEX VI.—Promulgated by Valentinian and Valens, 8th January (or, more probably, June) 364:—

Nulli liceat pistorum supplicatione delata, subterfugiendi muneris impetrare licentiam.

It shall be lawful to none of the pistors, on the occasion of a public thanksgiving being proclaimed, to procure license for escaping from his service.[1]

[1] Gothofred, *s.v.* this Law, points out that the rules forbidding the release of pistors only applied in their fulness to those who belonged to the Guild by birth, those condemned by sentence of a magistrate for venial offences being entitled to release by imperial rescript.

LEX VII.—Promulgated by Valentinian and Valens, 8th October 364:—

Post quinquennii tempus emensum unus prior à Patronis pistorum otio et quiete donetur; ita ut ei qui sequiter, officinam cum animalibus, servis, molis, fundis dotalibus, pistrinorum postremo omnem enthecam tradat adque consignet.

After a lapse of a period of five years, a chief patron of the pistors[1] may be allowed retirement and ease; sobeit, however, that he hand over and entrust to his successor the establishment, with its live stock, slaves, millstones,[2] and dotal lands[3]—in a word, the whole resources of the pistrina.

[1] "This shows that the patrons of the pistors were those who were placed over the several establishments of the pistors, who were entrusted with the care of the pistrina, &c., and to whom new pistors were committed in charge. . . . There being in Rome, from very early times, large establishments in which bread was prepared for distribution among the citizens (Socrat. Hist. Eccles. 5, c. 18), there were patrons placed over each of these. But although there were several patrons of a bakery, the prior or chief only of these was vested with supreme control, the others under him being indeed of the number of the patrons, but not yet come to chief control, waiting, each in his order, that authority. . . . As each pistrinum had its several patrons, so, too, a corporation chose patrons for itself, of whom one, however, was vested with supreme authority, and that for the space of five years." (Gothofred, *s.v.* this Law.) Gothofred goes on to cite corporation inscriptions relative to these elective priors, quinqueniales or quinquenalicii, from which he infers that certain at least of them were, though not continuously, still perpetually liable to service, some of the cited inscriptions pointing to second and third terms of service. The subject is, however, left somewhat obscure. The Præfectus Annonæ, or official in supreme charge of the public food-supply (originally appointed temporarily in times of stress), became a standing official about the close of the Republic. He was not, at least at first, an elected but an appointed functionary, and held his office under no restriction as to period." (Ramsay's Antiquities, *loc. cit. supra.*)

[2] "The function of the pistors extended not merely to bread-baking, but to the grinding of grain as well." (Paulus, b. III., tit. vi. sec. 64.)

[3] These *fundi dotales* were the lands held by the Corporation of the Pistors, from which they derived a revenue. (*Cf. infra*, Law XIX.)

LEX VIII.—Promulgated by Valentinian and Valens, 15th January 365:—

Ne cui qui semel pistorum corpori fuerit deputatus absce-

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dendi qualibet ratione copia facultasque tribuatur; etiamsi absolutionem eius pistorum omnium labor et adsensus concensus convenisse videatur; ne illud quidem cuiquam concedi oportet ut officina ad aliam possit transitum facere.

Make it your business to be on the watch that there be afforded to no one, who has once been enrolled[1] in the milling fraternity, means or opportunity of withdrawing therefrom on any pretext whatever—not even if it appears that by their labour[2] and common consent his fellow pistors concur in his discharge. Nor is it desirable that even so much liberty should be granted to any of them that it should be possible for him to make a change from one bakehouse to another.[3]

[1] *i.e.* by judicial sentence or ascription for less serious crimes.

[2] *i.e.* though it appears that there are so many pistors that, though one be freed, the whole labour can be sustained by those remaining. (Haenel.)

[3] This head of the law is directed to ensuring proper distribution of bakehouses throughout the city. Gothofred fairly enough infers from it that the labour of some pistrina was more severe than that of others.

LEGES IX. and X., promulgated by Valentian and Valens, have to do with the catabolenses or grain porters rather than with the Pistors proper.

LEX XI.—Promulgated by Valens and Valentinian, 27th September 365:—

Hac sanctione generaliter edicimus, nulli omnino ad ecclesias, ob declinanda pistrina licentiam pandi; quod si ingressus fuerit, amputato privilegio Christianitatis sciat se omni tempore ad consortium pistorum et posse et debere revocari.

By this our decree we provide in the most general terms, that to no one at all shall license be accorded, through the Church, to enable him to escape his lot as a pistor. Nay, if one shall have entered the Church.[1] let him understand that for all time to come he both can, and ought, to be recalled to the fellowship of the pistors, any privilege pertaining to his Christian ministry[2] being (to this extent) abrogated.

[1] *i.e.* probably "the clerical state."

[2] Gothofred points out a doubt whether the privilege here struck at was one which had been, actually or supposedly, incidental to the mere profession of Christianity or to the clerical status alone. While noticing the fact that instances existed of exemption from particular duties being accorded to *all* Christians out of respect to their religion, he leans to the view that in the present instance the privilege was peculiar to "clerks and ecclesiastics."

LEX XII.—Promulgated by Valens, Valentinian, and Gratian, and addressed to Claudius, Proconsul of Africa, 1st December 368 (?)[1]:—

Secundum parentis nostri Constantini diuale præceptum, omnibus lustris pistores, ex officio, quod ei corpori constat addictum, ad Urbem Sacratissimam destinentur; in quo illud convenit præcaveri, ne quis hanc, quæ personalis est, functionem pretio putet esse taxandum; veniant suo tempore quos causa constringit; et ita veniant, ut eos officium quod tibi paret, pistorum patronis adque P. F. Annonæ aput publica monumenta

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consignet. Quod si quis judicum statuto tempore personam quæ est destinanda, non miserit, ipse profecto remanebit obnoxius functioni, cui subtraxisse probatur obnoxium. In officium quoque pœna competens exeretur, quod aut dissimulatione neglexerit, aut fraude subtraxerit judicem suum super vi legis et consuetudinis admonere.

According to the divine command of our Father[2] Constantine, let pistores be sent every five years to our most sacred city (Rome) from that sphere of Jurisdiction[3] which has been assigned to the Pistorian Guild. In regard to which matter, it is proper that the Officials be put on their guard lest any of them imagine that this duty, which is a personal one, may have a price put upon its performance. Let those come, each at his own proper time, whose position has brought them under liability; and let them come, too, in such wise that the Bureau, which owes you obedience, may make report of them in State records, to the patrons of the pistors and to the Inspector-General of the Public Food Supply. And if any Judge shall fail to send at the appointed time any one who is due to be sent, then, forsooth, he himself will come under liability for the duty from which he is proved to have withheld one who was amenable to it. Let a suitable punishment, too, be demanded over and above the force of law and custom against any officer of his court who either has with dissimulation neglected, or has by fraud deliberately forborne to put his Judge in mind [of any persons to be sent][4]

[1] This date is doubtful.

[2] A respectful form of allusion frequently used by later emperors towards their predecessors.

[3] *i.e.* apparently the office (or bureau) of certain of the *inferior* judges in Africa (*vide infra*, "owing obedience to you"), the persons sentenced in whose courts, for minor offences, were prescriptively assigned to the Corporation of Pistores.

[4] *cf.* also Lex XVII. *infra*.

Lex XIII.—Promulgated by Valentinian, Valens, and Gratian, 1st June 369:—

Non ea sola pistrini sint, vel fuisse videantur quæ in originem adscribta corpori dotis nomen et speciem etiam nunc retentant, sed etiam ea quæ ex successione pistorum ad hæredes eorum, vel quos alios, devoluta noscuntur, quo eorum quoque distractio inhibita evidentius cerneretur. In his vero solis liciti contractus eidem corpori reservetur quæ ad ipsos non hæreditario pistorum nomine, sed privatorum institutione, liberalitate, vel dote aut quolibet titulo probantur esse transfusa, et si qua ipsi ex privata munificentia consecuti, in rebus humanis agentes, in aliquem ex sociis, id est in pistorem alterum, transtulerunt. Cæterum si hæc quoque in successione propria reliquere, etiam eadem dotis nomine et titulo nuncupamus; quia pistrino proficere convenit, quod aput pistorem eo vivente permansit. Servavi igitur decetero ordinem constitutum, ut si vel donatione pistoris rem pistrino hæreditatis successionisque meritis obligatam quicumque ex privatis a pistoribus fuerit consecutus, sciat corpori obnoxium

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vendere et alienare non posse, sed in sua causa et pistorum nomine ac jure residere.

There are found to be included among the proper goods of a pistrinum not only those things which—originally consigned to the Corporation of Pistors—still retain the semblance and name of "dotal property," but also such goods as are known to have devolved through the course of succession to pistors or their heirs or others, alienation by any of whom is clearly to be accounted as forbidden. Contracts are indeed allowable to [members of] this Guild only in regard to those things which are proved to have been conveyed to themselves, not by inheritance in their character of pistors, but by bequest or the liberality of private persons, or as dowry, or by some other such title, and anything which they themselves, having acquired it by private bounty, may, engaging in affairs, have conveyed to one of their confrères, *i.e.* to another pistor. Moreover, if even such private possessions are left in the succession of their owners, we reckon them also under the name and title of "dotal," because it is fitting that what has remained the property of a pistor throughout his life should go to the benefit of his pistrinum. It is therefore maintained, as an established rule, that if any one whosoever has obtained from pistores out of their private goods, by donation of a pistor, anything which is the due of the Guild, either by desert of heirship or succession, he must know that he cannot sell or alienate the property which is within the Guild's prerogative, but it remains in its peculiar position, and both in name and in law belongs to the pistors.[1]

[1] A pistor might possess property of two classes :—

(A) The annexed property of the Guild, under which fell—
  (*a*) The bakery, its animals, implements, slaves, &c. &c.
  (*b*) Lands astricted to the Guild = *fundi dotales*.
  (*c*) Property derived by him by gift, bequest, or succession from a pistor.
  (*d*) Property representing gain made by him as a pistor.

  The term "dotal" more strictly belongs to the first two heads of the group ; but all have this in common, that the possessor could not alienate them to any one other than a descendant or relative liable to serve as a pistor. *Cf.* ll. i. and iii. *supra*.

(B) Property held by them by private right—
  This included whatever they acquired by bequest or inheritance from others than pistors, by gift or any other such title, and also, it would appear from the text, even what was acquired *inter vivos* from another pistor who held it in private right. All such property was called *adventitium*, and could be alienated, *inter vivos;* if not so alienated, however, it too on the death of the pistor fell to be dealt with as annexed to the Corporation.

LEX XIV.—Promulgated by Valentinian, Valens, and Gratian, 22nd February 372 :—

Si cui pistoris filia nubserit, ac postea is eandem dilapidatis facultatibus consortio putaverit eximendam, non alia lege adque ratione eundem pistoriæ necessitati et corpori præcipimus adstringi, quam eodem munere originis vinculo teneretur.

If the daughter of a pistor shall have married any one, and if afterwards—her goods having been squandered—her husband shall suppose that she [and he] ought to be released from the

fellowship of the Corporation, we ordain that he shall be bound to the lot and Guild of the Pistors by the very same tie of law, and to the same effect, as if he were held to the duty by the bond of origin.[1]

[1] *cf.* note to ll. i. and ii. *supra.*

LEX XV.—Promulgated by Gratian and Valentinian, 16th February 377:—

Ne quis unquam P. F. Annonæ contra suam alienum sententiam, pistorum locum ejectis permiserit reformari; cum præscriptum suum aput judices obtinere lex debeat, per quam simul, adversus decoctorum vitia, et utilitati annonæ publicæ et rerum judicatorum constantiæ providentur.

Let no Inspector-General of the Food Supply allow a pistor who has once been expelled to be restored to his place among the pistors in the face of a sentence pronounced either by himself or another, since the law ought to maintain before the judges its rule by which it has made provision against the misdeeds of bankrupts,[1] at once for the sake of the department charged with the public food-supply, and in the interests of the authority of judgments.

[1] Bankruptcy was only one offence which justified expulsion. Any conduct injurious to the interests of the food supply seems to have been also sufficient. Gothofred points out that these provisions specially had regard to the patrons of the Guild, since to them was entrusted the care of the corporate property.

LEX XVI.—Promulgated by Gratian, Valentinian, and Theodosius, 13th June 380:—

Quidquid ex horreis plectibili usurpatione præsumptum sit, id per pistores (in quos totius criminis conserter invidia) matura exactione reddatur; ut si quid in hac specie minus potuerit exsolui, in quibuscumque speciebus in auræ, vel plumbo, seu qualibet alia solutione, pensetur, dummodo redintegratio totius summæ curetur.

Whatever has been abstracted from the public granaries of Rome by culpable seizure, that must be restored by suitable levy among the pistores (on whom the whole odium of such an offence is laid). And if it cannot be refunded in the form of grain, then it may be paid in any form you please—in brass or lead,[1] or any other way, so long only as restoration of the whole amount is provided for.

[1] Gothofred points out that these substitutes were suited for use in making and repairing the pistrina and implements used in the work.

LAW XVII.—Promulgated by Gratian, Valentinian, and Theodosius, 10th July 380; (addressed to Titianus, Vice-Regent (Vicarius) of Africa):—

Judices Africanos laudabilis Sinceritas Tua. Huismodi in terminatione conterreat, ut nisi tempore solito debitos Pistores Venerabilis Romæ usibus ditigere curaverint, sciant siepos,

2. Laws.

quinquaginta argenti librarum, officiumque eorum pari condemnatione multandum.

Let your praiseworthy zeal lead you to constrain the judges of Africa by the threat, that unless they take care at the accustomed time[1] to despatch the pistors who are due for the service of our sacred city of Rome, they must know that they themselves will be amerced in fifty pounds of silver, and the Officials of their Court in the like penalty.

[1] *i.e.* every five years. *Cf.* Law XII. *supra.*

LAW XVIII.—Promulgated by Valentinian, Theodosius, and Arcadius, 11th June 386:—

Ut concessa Decurialibus privilegia nolumus abrogare, ita lege super mancipibus data nihil jubemus imminui; nam si qui ob hoc ad Decurias inliciti transierunt, ut munus evaderent mancipatus, necesse est erga eos privilegia non posse servari, qui obnoxios sibimet recte vindicat functio memorata. Intantum etiam defensiones diversorum Principum largitate concessa erga Decurias manere decernimus, et mancipatui obnoxios jubemus addici, ut si quispiam super absolutione mancipatus nostræ Majestati preces obtulerit, bonorum amissione plecetur. Quod quidem non solum in Decurialibus sed etiam in cæteris decernimus perpetua lege servari.

As we are unwilling that the privileges which have been conceded to the Decurial Militia should be taken away, so also[1] it is our command that no encroachment be made upon those given by the law to the corn-factors.[2] Thus if there be any who have unlawfully gone into the militia with the mere view of evading their duty as corn-factors, it is most necessary that it should not be possible that any privileges should inure for the benefit of these men, whom the said duty rightly claims as its debtors. Under this qualification only, do we decree that the privileges available as excuses, which have been granted by the bounty of various princes, remain available to the Decuries; and we command that the Decuries be held amenable to service as corn-factors. So that if any one shall proffer petitions to Our Majesty for absolution from duty as corn-factor, he shall be punished by forfeiture of his goods.[3] And this indeed we decree to be observed as a law in perpetuity, not only in regard to those enrolled in the militia, but also to all others.

[1] Gothofred explains this law as being an attempt to harmonise the special privileges given to the Decurial Militia with the claims of the Trade Guilds, and more especially with those of the Pistorian Guild. "As he wishes to preserve their own privileges to decurials (with which view he confirms them), so in turn he does not desire that the duty of service as a corn factor should be made void by any claim on the part of the militia. As to each corporation its privileges, so also to each its members are to be preserved; and the privileges of one are not to be strained to the detriment of another."

[2] *Mancipes*, here translated as "Corn-factor," means strictly a farmer or collector of any department of public revenue or service. Here it has probably reference to the position of the pistors as receivers of allotments of grain to be converted into and distributed by them in the form of bread. Gothofred cites a number of passages in which *Mancipes Pistorii* seems to be used in the sense only of those in charge of *Pistrina*, but he indicates his own view that here the

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expression is to be understood "de omnibus pistoribus qui panem conficerent, coquerent."

[3] *cf.* Law VI. *supra* and Law XX. *infra*.

2. Laws.

LAW XIX.—Promulgated by Arcadius and Honorius, 7th July 396:—

Pistores Urbis Æternæ prætermissa veteri consuetudine, fundis vel prædiis ad nihilum redactis, quæ eorum corporis solatia certa præbebant, novos sibi quæstus excogitasse comperimus. Ideoque in futurum provisionis remedia proferentes misso probatæ industriæ viro, singulorum fundorum sive prædiorum quæ pistorum corpori obnoxia sunt, vires discuti exquirique præcipimus, ut idem jure perpetuo idoneis adixa præstatione tradantur adque conductores præstationis modum et solatia ministrent antiquitus constituta pistoribus.

We have ascertained that the pistors of the Eternal City have —inasmuch as the farms and estates[1] which were wont to render a certain support to their corporation have, through the disuse of ancient custom, been reduced to worthlessness—devised new means of profit for themselves.[2] And therefore, with the view of providing remedial measures, by way of precaution for the future, we order that the resources of each single farm or estate which is subject to the Pistorial Guild be discussed and investigated by a commissioner of approved diligence appointed for the purpose, in order that these lands may be given off in perpetual tenure[3] to suitable persons, subject to a rent. And the tenants shall render the amount of the rent and the "easments" appointed of old.

[1] These farms and estates are those before referred to (*e.g. supra*, Lex VII.), as "Dotal Estates." They were scattered throughout various provinces. Gothofred surmises that these were at one time administered by stewards, who rendered account to the patrons of the pistors, but that, little by little, they became reduced in value and their productiveness diminished, until the pistors were driven to seek out new means of revenue.

[2] What these were is not indicated. Gothofred suggests that they took the form of petty imposts exacted from those to whom they furnished bread.

[3] *i.e.* in the tenure known as "Emphyteusis," the precursor of the modern Feu Farm, under which the rules of holding, rent, &c., were clearly defined.

LAW XX.—Promulgated by Arcadius and Honorius, 25th April 398—(being a law forbidding the liberation by imperial rescript of those sentenced by a Judge to labour under the Pistorian Guild):—

Adscribtis semel per sententiam Judicis ordini pistorio subreptitia rescripta non quærant, nec ulla eis supplicandi præstetur facultas. Et qui hujusmodi sperare voluerit beneficia, quinque libras auri fisco nostro inferre cogetur. Si quo enim casu, vel occultis, vel ambitiosis hoc precibus elicuerit, Judex, cuius in judicio hæc fuerit prolata sententia, officium quoque eius, si consensum præbuerit impetratis, quinas auri libras ærario nostro inserent.

Those who are once condemned by sentence of a judge[1] to labour in the Pistorian Guild must not surreptitiously seek

rescripts,[2] nor must any opportunity of soliciting such be afforded to them. And as for any one who has schemed to obtain favours of this sort, let him be compelled to pay to our Exchequer five pounds of gold. And if on any pretext he has obtained this, either by underhand entreaties or by bribery, let the Judge from whose Tribunal these judgments have emanated, and the Officials also of his Court (if they have lent their countenance to the suitors), pay into our Treasury twenty pounds of gold.[3]

[1] *cf. supra*, Laws VI. and X.

[2] *cf. supra*, Law VIII. Prior to this law of Honorius, it appears that while persons sentenced to such service did not take the benefit of a *general* amnesty to criminals, still they might be released by special rescript. This law seems to have been primarily directed for the guidance of the African judges who had power to sentence to the Pistorian Guild.

[3] Gothofred suggests that these penalties may have been specially aimed at liberation obtained by rescripts procured through the intervention of ecclesiastics.

LAW XXI.—Promulgated by Arcadius and Honorius, 8th March 403 (addressed to Vitalis, the Inspector-General of Food Supply):—

Nulli pistori, nec posteris ejus, in privatas personas, vel Thymelicas, vel eas quæ Aurigandi studio detinentur, liceat conjugii societate transire; etiamsi huic facto omnium pistorum accedat adsensus etiamsi nostra elicita fuerint alique subreptione rescripta. Quod si quisquam in hæc vetita adspirare temptaverit, sciat se verberibus adfectum deportatione puniendum, facultatesque suas paneficio sociandas. Quod si non statim Officium Gravitatis Tuæ in ipsis inceptis occurrerit, sed in suggestione cessaverit, in singulis familiis librarum auri decem multa feriatur. Ita ut hæ quoque personæ cum patrimonio ad debitum officium revocentur, quæ per hujusmodi nuptias in simili consortio fuerunt. Omnes igitur, qui filias pistorum in consorti sunt, vel ex Thymelicis, vel Aurigis, vel universis privatis, pistorio corpori ilico deputentur.

It shall not be lawful to any pistor, or to his descendants, to enter into the tie of marriage with women unconnected with the Guild,[1] or with actresses or circus performers, even if to such a union the approval of all the pistors be accorded—nay, even if rescripts have been obtained from us by any device. And if any one of the pistors or their descendants shall have essayed to seek after such a forbidden union, let him know that he is liable, after having been scourged, to be punished by banishment, and his goods to be handed over to the Guild. Moreover, if the Officials of your responsible Department shall not oppose it from the first, but shall fall in with the suggestion, they shall be amerced in ten pounds of gold for each family. So, however, that any such person, with her patrimony, shall fall under liability for the service due to the pistors which she by such a marriage agrees to undertake in like manner with her spouse. In like manner let all who are joined in marriage with daughters of pistors, whether actors, circus-riders, or any

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kind of private person, be forthwith enrolled as amenable to the Guild.[2]

[1] *Privatas personas*=women not members of a family attached to the corporation.

[2] *cf.* Laws II. and XIV.

LEX XXII.—Promulgated by Honorius and Theodosius, 26th December 417:—

Quicumque in lustris Urbane Sedis, vel Annonariæ Potestatis Apparitor, clandestina fraude pistorem concusserit, accusatus adque convictus perpetuis paneficii nexibus addicatur.

Whatever Official,[1] either of the Prefect of the City or of the Inspector-General of Public Food Supply, shall be found to have harassed a pistor by secret fraud,[2] having been accused and convicted, is to be adjudged to perpetual servitude as a pistor.

[1] This is a fragment of a constitution of Honorius directed against malpractices in connection with the public food-supply, other portions of which, striking at frauds in other departments, are referred to by Gothofred.

[2] As by delivery of grain of inferior quality or insufficient in quantity. *Vide* Gothofred and Le Mare's synopsis (*supra*).

At the very period of the issue of laws intended, among other things, to enhance the status of the craft, the chronicler Ammianus Marcellinus, writing towards the close of the fourth century, affords a practical commentary upon their desirability in this and other respects, by his phrasing of a popular story, respecting Terence, harking back to those more ancient terms of opprobrium by which all pistors, from Octavius Augustus onwards, had invariably been greeted:—

Hist. Rom.: xxvii. iij.

At this time (367 A.D.), or a little before, a new kind of prodigy appeared in the corn district of Tuscany, those who were skilful in interpreting such things being wholly ignorant of what it portended. For in the town of Pistoja, at about the third hour of the day, in the sight of many persons, an ass mounted the tribunal, where he was heard to bray loudly. All the bystanders were amazed, as were all those who heard of the occurrence from the report of others, and no one could conjecture what was to happen.

Soon afterwards the events showed what was portended, for a man by the name of Terence, a person of low birth and a pistor by trade—as a reward for having given against Orsitus, formerly prefect, information which led to his being convicted of peculation—was entrusted with the government of that same province. And becoming elated and confident, he threw affairs into great disorder, till he himself was convicted of fraud on transactions relating to some ship-masters, as was reported, and was executed while Claudius was prefect of Rome.

CHAPTER VI.

THE FLOATING MILL.

VI. THE FLOATING MILL.

1. Roman.

1. ROME, which produced the watermill of Vitruvius, also originated in a later period the floating mill; the former, a contrivance adopted in the interests of peace, and the latter, a device executed in the exigencies of war. Janiculum, the special locality of the ordinary watermills, was also that of the first floating mill, and of its successors on the Tiber down even to the present century.

In the year 536, Rome, in the course of a siege by the Goths under Vitiges, being reduced to the verge of starvation by the interception of the water supplying the mills of Janiculum, the commander of the garrison, Belisarius, a man of ready resource, devised a mill to float on the Tiber. Gibbon makes no allusion to the invention, merely remarking (not quite correctly) that "so effectual were the precautions of the Roman general, that the waters of the Tiber still continued to give motion to the mills." But the ancient historian Procopius, writing within half a century after the event itself, furnishes an interesting account of the circumstance:—

Decline and Fall: Bk. vii. ch. 41.

When the water was cut off and the mills stopped, and cattle could not grind, the city was deprived of food, and provision could scarcely be found for the horses. But Belisarius, an ingenious man, devised a remedy for the distress. Below the bridge across the Tiber, which arches to the walls of Janiculum, he extended ropes, well fastened across the river from bank to bank. To these he affixed two boats of equal size, two feet apart, at a spot where the current flowed with the greatest velocity under the arches; and placing large millstones in one of the boats, he suspended the

Gothicorum, ed. 1531, i. 19.

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1. Roman.

machines by which they were turned in the water space between. He also contrived, at certain intervals on the river, other machines of the like kind, and these being put in motion by the force of the water, drove as many mills as were necessary to grind food for the city.

The experiment was rewarded with complete success, and by providing booms to fend off the logs and dead bodies which the enraged Goths floated down the stream for entangling with the wheels of the new mills, these contrivances were made to grind till the discomfited Goths retired. So notable an event thoroughly established the fame of boat-mills at Rome, where, till even the present century, they were to be seen moored near the old site of the mills of Belisarius at the bridge of Janiculum.

Antichita Romaine: Rossini: 1829, Pl. xlvj.

Janiculum Bridge and Mills, Rome.

In the illustration appears the celebrated bridge as restored by Sixtus IV., and, in the foreground, a mill near a slip pier, down which mules carrying sacks of grain are being driven; another mill partially appearing on the opposite side of the view. In each case

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the water-wheel, though not very clearly perceivable in our small photograph, is placed upon a barge or pontoon alongside the mill-hurst, as is the case at the present day on the Danube.

1. Roman.

2. Among the earliest evidences of floating mills derived from Rome are those of the boat-mills of Venice in the tenth century. Beckmann states that these mills "righted themselves by the ebb and flow of the tide every six hours, the wheels changing their position to meet the altered run of the current," probably in somewhat the same way as the tide-mills of 1761 and 1764, which received the premiums of the Royal Society of England. Zanetti produces evidence of these mills existing at Venice in 1078, 1079, and 1107, but is incorrect in terming them "tide-mills," which were of an altogether different character. Floating mills occur in various continental charters of the twelfth and thirteenth centuries under the designations molendinum navale, ship mill, and molendinum pendens, loose or movable mill:—*e.g.* "The two mol. navaliæ which are on the Garonne" (1290); "We grant to William Roland, knight, and his heirs the right of constructing, having, and holding mol. navaliæ" (1337); "Ship or pendant mills, mol. navencæ seu pendentia" (1301); "Moulin pendu under the bridge of Orleans" (1306). In the first Crusade, again, it appears to have been floating mills which were destroyed by the troops of Peter the Hermit at Nissa, in Bohemia:—Septem molendinis que sub ponte in flumine degebant ignem submiserunt: seven mills under the bridge in the river they burnt and sank.

2. Medieval.

Hist. Inventions, 1797, 245.

Orig. Arti. Principe: Venice, 1758, 71.

Gloss. Carpentier, col. 1304.

Chron. Hierosolym: 1584, lib. i.

A French MS. of the fourteenth century, in the British Museum, a *Roman d'Alexandre*, preserves in the guise of imaginary "Mills of Babylon" of about the year 360 B.C., a representation of French floating mills of the date of the MS. The illustration com-

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2. Medieval.

prises portion of a handsome miniature depicting the city of Babylon, wherein in a Gothic castle surmounted by towers and turrets, and representing doubtless the great Temple of Belus, is seated

Harl. MSS 4979, 4b.

"The Mills of Babylon"—*From Fourteenth Century MS.*

Nectanebus, King of Egypt. In the portion of the drawing shown appears "the balm gardens" on an island near the city, and hard by is "the river of Frate and the mills which are there."* Two millhursts are shown, erected amidships upon boats having high prows and sterns, the water-wheel of each, driven by the stream, projecting over the side in a manner giving to the vessels some quaint resemblance to modern paddle-wheel steamers. Other imaginary "Mills of Babylon," from a later MS., are illustrated in the next chapter.

There were floating mills on the Seine in the reign of Louis VII. (1137–80), and the type remained as the principal mills of Paris till the sixteenth century. In La Mare's maps of the city at various dates during this period they invariably appear, being marked as boats moored in the stream near the Grand Pont, the present Pont-au-Change. In 1258, when Etienne Boileau recorded the "Registres des Mestiers et Mar-

Traité, 1705 I. i. passim.

* *Phrat* was the ancient Hebrew and Assyrian name for the river which the Greeks called the Euphrates, but which is still called by the people living in its vicinity *El-Frat*, the good or beneficent river.

chandises de la ville de Paris," a curious enactment (among the many recorded in another volume) regarding the floating mills was recited :—

Li meunier de Grant Pont ne pueent deslieuer nullui, et se il le fait, et li deslieués s'en plaint au sergant qui est garde des meuniers de Grant Pont de par le chapitre Nostre Dame de Paris, il est à vj deniers d'amende, aveuc le damage que il rent au deslieuée ; et se li deslieuées s'en plaint au sergant du chapitre, il l'amende au chapitre en ij sols vj deniers de Paris ; desquex ij sols vj den. li mestres des molins a vj deniers pour s'amende et li chapitres le remanant.

Fr. Doc. Inedit.: Arts et Metiers, tit. ii.

The millers of Great Bridge shall not unloose (or unmoor) any mills. But if any one do this, and the millers who are set adrift complain to the sergeant who supervises the Great Bridge mills on behalf of the Chapter of Notre Dame, the offender shall pay sixpence fine, with cost of damages caused to the mill set adrift. If the complaint be made to the sergeant of the Chapter, the offender shall pay to the Chapter a fine of two shillings and sixpence Paris money, of which sum the masters of the mills shall have sixpence amends and the priests of the Chapter the remainder.

These mills seem to have been destroyed at the destruction of the bridge in 1296, and replaced by structural mills built beneath the arches, a view of which, in the fourteenth century, appears in the next chapter. Still, floating mills were on the Seine in the eighteenth century, as shortly to be described.

In Great Britain the only authentic record of the establishment of floating mills on a large scale appears to be that of their twice being attempted, and each time speedily abandoned, on the Thames. The historian Maitland, referring to the subject, remarks, "I have read of the like to have been in former time," and quotes, but without stating the source of his information, the following :—

In the year 1525, the 16th of the reign of King Henry VIII., Sir Wm. Bayley being mayor, John Cooke of Gloucester, mercer, gave to the mayor and commonalty of London, and theirs for ever, one great barge, in the which two great corn mills were made and placed. Which barge and mills were set in and upon the stream of the river of Thames, within the jurisdiction and liberty of the city of London. And also he gave to the same city all such timber, boards, stones, iron, &c., provided for making, mending, and repairing of the said barge and mills. In reward whereof the mayor gave him £50 presently and £50 yearly during his life. And if the said Cooke

Hist. Lond., 1756: 1030.

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deceased before Joan his wife, then she to have 40 marks the year during her life.

2. Medieval.

In 1588 we find these mills abandoned in favour of costly structural watermills of ordinary type, built at London Bridge; but in the meantime barge-mills were apparently utilised as a penal establishment. "In 1581 the Queen, riding by Aldersgate Bars, towards the Islington Fields, to take the air, was environed by a crowd of sturdy beggars, who gave the Queen much disturbance: that same evening Fleetwood, the recorder, had the fields scoured, and apprehended seventy-four rogues, some blind, 'yet great usurers, and very rich:' the strongest of the seventy-four 'they bestowed in the milne and the lighters.'" The second unsuccessful attempt to work floating mills two centuries later is thus recorded by Maitland:—

Old and New Lond.: ii. 255.

> Against Queenhithe [Thames Street, E.C.], on the river Thames, of late years was placed a corn mill upon or betwixt two barges or lighters, and these ground corn, as watermills in other places, to the wonder of many that had not seen the like. But this lasted not long without decay, such as caused the same barges to be removed and taken asunder and soon forgotten.

This appears to close the transient record of these mills, and, in fact, only nineteen years after Maitland wrote the above, we find the indefatigable metropolitan archæologist Strutt compelled to remark: "As to the ship-mill, I must own I have not the least idea of either its form or construction."

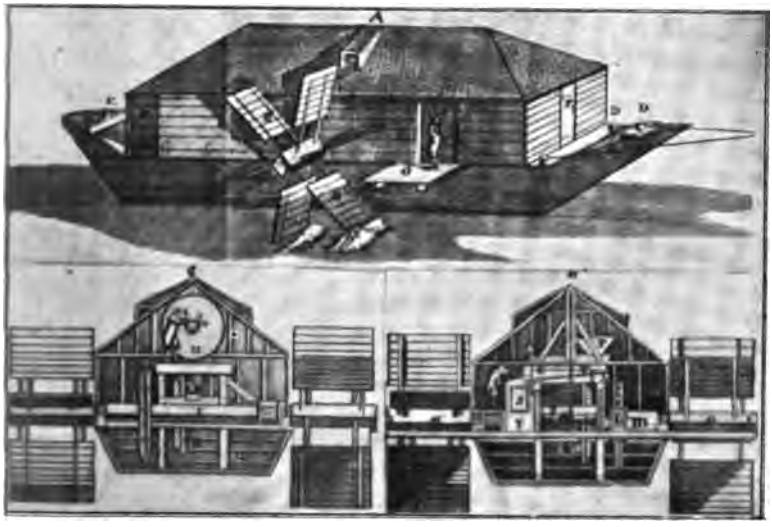
Horda, Ang. Cyn., 1775: ii. 13.

3. Modern.

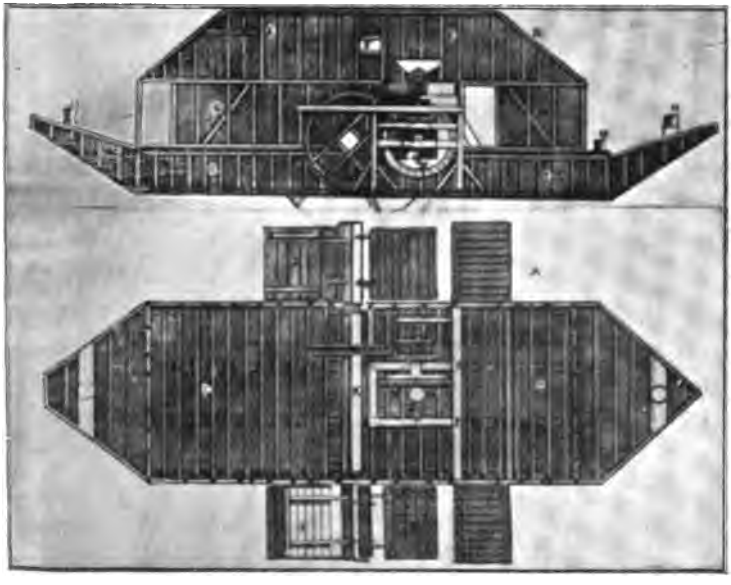
3. Though the floating mills at Paris, in the twelfth century, seem to have been abolished in 1296, as already mentioned, the Seine is found, five centuries later, again bearing these curious structures. Leander, in the middle of the eighteenth century, gives an excellent description of them, accompanied with the diagrams we reproduce.

Spectacle de la Nature, 1753: v. 321.

Fig. 1 shows the general aspect of the mill with the water-wheel, and a platform in the rear of it, upon which one of the millers is standing; this was the



(Figs. 1, 2, 3.)



(Figs. 4, 5.)

Floating Mills on the Seine, 1753.

VI. THE FLOATING MILL.

3. Modern.

receiving and despatching platform. Fig. 2 is a section amidships looking aft; the steps leading to the hopper and the top of the stones are here seen, and a miller is represented dressing the upper stone, raised on edge for the purpose. Fig. 3 is a section amidships looking forward: GG is a platform running across the boat from side to side: up the first flight of stairs a miller is seen carrying grain towards the hopper, P: the millstones are marked O; trough for receiving flour, S; bin, Y; cable or rope for raising millstone for dressing, Z; chopper, T: at the left-hand corner of the millstone casing, beside the miller, is seen the usual small signal bell. In Fig. 4, a longitudinal section, the position of the mill is more clearly shown, the hopper surmounting it in this case being lettered Q. Fig. 5 is a general plan, showing the same details: II, water-wheels on both sides of the boat, turning the shaft K: L, cog-wheel on shaft K: M, trundle turning cog-wheel N, which latter actuates the vertical trundle-head O, from which the spindle rises to the millstones. The total length of the boat was 55 metres, about 60 yards; the length of the house being 40 metres, about 43 yards.

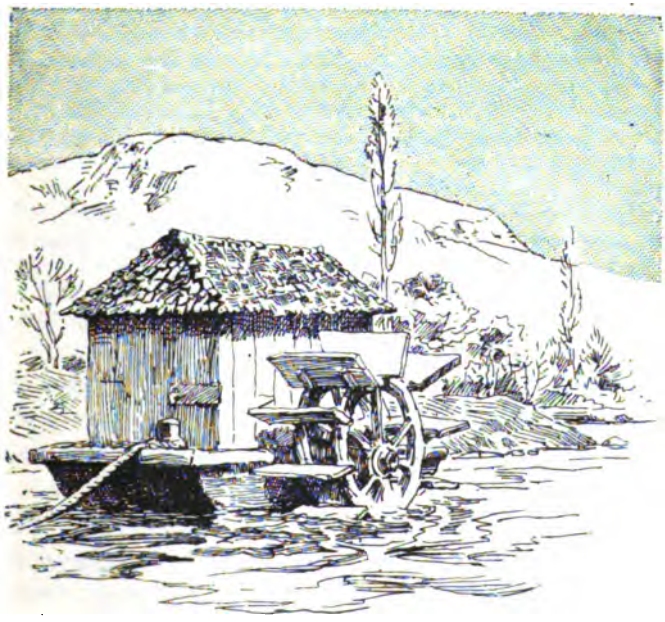
Vie Privée des Fran.: D'Aussy, 1782.

The city of Lyons, also, until about a century ago, was almost entirely provided with flour by floating mills, there being no convenient facilities for other watermills, while windmills had been abandoned on account of the impossibility of protecting them from frequent storms. Boat-mills moored in the Rhone, however, caused so great an impediment to the navigation of the river, and caused so many wrecks, that in 1768 the municipality offered a prize for any invention which might supersede them. Twenty-one years before this an improvement had been attempted at the suggestion of De Boste, the wheel being placed at the end of a long bearing, at the rear instead of the side of the boat, the craft occupying

less width-space, but still proving too incommodious to be retained.

In Asiatic Turkey the floating mill still continues in use. The Rev. J. E. Davis, who travelled through the country nearly twenty years ago, describing floods at Missis, the ancient Mopsuesta, on the Pyramus river, mentions that in an inundation in 1874 "one of the floating corn-mills at Missis was washed away and sunk, eight persons being drowned." About a year ago a special correspondent in Armenia refers to and sketches the same structures at Missis:—"In the river were creaking and groaning some curious float-

Asiatic Turkey: 1879, 66.



Daily Graphic, Feb. 3, 1897.

Floating Mill in Armenia.

ing mills, lazily tugging at their chains, and swaying back and forth with the current which furnishes the power." Compared with the French mill, with wheels on both sides of the craft, the Armenian

VI. THE FLOATING MILL.

contrivance will be perceived to be a very inconsiderable structure.

3. Modern.

At various places along the Danube also the mills are still in frequent use. Mr Wilson Marriage, of Colchester Mills, in forwarding a photograph of several lying at Rath, in Hungary, states that the mill is driven by a single wheel, and the further bearing of the main shaft is supported on a pontoon :—

Milling, Feb. 27, 1897.

> Both the mill-barge and the pontoon are anchored in the stream; the current acting on the broad flat vanes of the wheel turns it slowly, and the power is transmitted to the machinery in the mill. As the river rises and falls, so the mill and pontoon also rise and fall. In severe winters the mills have to be removed from their anchorage to avoid destruction by the masses of ice. The corn is conveyed in boats to the mills, and the manufactured goods landed in the same. During recent years the number of these mills has greatly lessened, owing to the competition of the gigantic steam flour factories established in the great cities, and they may in time disappear, as the picturesque country mills and windmills in other countries seem likely to do. The mills were photographed from the passenger steamer in passing through the great fortress of Komoru, in Hungary [the photograph unfortunately proving too indistinct for reproduction]. At Raab and other places there are still many of these interesting mills to be seen at work, not all of which are employed in corn milling, however. A large working model of one of these mills, with other types and examples, was exhibited by the Millers' Association of Hungary at Budapest, at the National Millennial Exhibition in 1896.

Within recent years mills erected on board ship by the British Government, for use during the Crimean War, have generally been termed floating mills; but as their motive-power was not derived from the current of a stream, but from steam, they do not belong to this present series, and are referred to in a later portion of this history.

CHAPTER VII.

THE EARLY CONTINENTAL MILL.

VII. EARLY CONTINENTAL.

1. EVIDENCES of the watermills of Europe occur almost at the period of the Roman Justinian Code.

1. Salic Laws.

The Salic Laws contain stringent provisions for the protection of mills. These enactments are attributed by some to Clovis, who came to the throne in 481; but what is certain is that they were old in the time of Charlemagne, who confirmed and consolidated them in 798. Considerably earlier than this date, however, is the evidence of Geoffrey of Tours, who wrote towards the close of the sixth century. In his *History* he mentions a stream at Dijon, which ran by a mill with marvellous velocity; and in the *Lives of the Fathers* instances a case of an abbot building a watermill to relieve the monks from the drudgery of grinding by hand. This mill was established on the Anger, where the stream, being confined in a race between pales, and provided with sluices made of great stones gathered from round about, caused the wheel to revolve with great rapidity :—

Op 1699, iii. 19, 126.

> Ursus abbas hæc ageret, ac fratres molam manu vertentes triticum ad victus necessarium, comminuerent, pro labore fratrum visum est ei molendinum in ipso Angeris fluvii alveo stabilire; desixisque per flumen palis, aggregatis lapidum magnorum acervis exclusas fecit, atque aquam canale collegit, cujus impetu fabricæ rotam in magna volubilitate vertere fecit.

Vita Patrum : xviii.

The gradual introduction of watermills also may aptly be shown by reference to the chartulary of the French Abbey of St. Bertin. In the foundation charter granted by Edroaldus in September 648, the

Fr. Doc. Inedit., vol. xxxviii.

VII. EARLY CONTINENTAL.

1. Salic Laws.

farinarii (literally either the flour-men or flour-places) are included among the mansions, woods, and lands granted to the monks. The same peculiar term occurs in one of the Salic Laws shortly to be quoted, there meaning distinctly the flour-place or the mill; and again in a charter of St. Bertin of May 16, 704. Later charters of this house contain no references to mills till the year 855, when the abbey held three, which were rented out for thirty large measures of flour annually. It was at this house, too, that Abbot Odlandus (who died in 805) distinguished himself by inventing a new watermill, which the monks say turned against the current of the stream, a thing never seen before in their day, and so wonderfully made, that no man presumed to construct such another. Still, though for a time the monks preserved the marvel for the use of their house, they unfortunately failed to adequately describe it:—

Ibid.: Cart. Sithieuse, i. 48.

Ibi etiam, quod mirabile nostris hactenus monstratur temporibus, molendinum fecit volvere aquis contra motum currentibus: constituitque ut nullus hominum molendinum extra locum jam dictum construere presumeret: quod ad utilitatem monasterii ad tempus fuit conservatum.*

Reverting from these scattered evidences to the laws themselves, various provisions are found very similar to those of the laws of the Romans and Ostrogoths, together with one or two novel features regarding the millers:—

Leg. Francorum Salicæ: tit. 11, cap. 5.

Si quis servum aut ancillam valentem sol. xv aut xxv furaverit aut vendiderit, seu porcarium aut fabrum, sive vinctorem, vel molinarium, aut carpentarium, sive venatorem aut quemcunque artificem IIDCCC den. qui faciunt sol. LXX culpabilis judicetur.

If any one shall steal or sell a man-servant or a maid-servant, worth from fifteen to twenty-five shillings—whether such servant be employed in the piggery, the smithy, the kitchen, the mill, the carpentry shop, the hunting field, or in any trade whatever—shall be adjudged to pay 2800 pence, which make seventy shillings.

* It is in accordance with the genius of Abbot Odlandus that his chronicler records him to have been so exceedingly sensitive and ingenious that he could tell by ear where water flowed in hidden courses underground; a not invaluable talent for any founder of watermills.

VII. EARLY CONTINENTAL.

1. Salic Laws.

Qui alienam annonam in molendino seu pistrino furatus fuerit, molinario seu polentario DC denaris qui faciunt solid XV, et ei cujus erat totidem, culpabilis judicetur.

Whoso shall steal the grain of another in a mill, shall be adjudged to pay to the miller or flour-man 600 pence, which makes fifteen shillings, and to him who owned it its total value.

Ibid.: tit. 5, c. 1.

Si quis ferramentum de molino alieno furaverit IDCCC den. qui faciunt sol. XLV culp. jud.

Ibid.: tit. 24, c. 1, 2, 3.

Si quis sclusam de farinario * alieno ruperit DC den. qui faciunt sol. XV culp. jud.

Le Mare: Traité, tom. ii., tit. 9.

Si quis viam quæ ad farinariam ducit, clauserit, sexcentis denariis qui faciunt solidos quindecim culp. jud.

Any one stealing the irons of a mill shall pay 1800 pence, which makes forty-five shillings.

Any one breaking down the sluice of a flour factory shall pay 600 pence, which makes fifteen shillings.

Any one closing a road leading to a flour factory shall pay 600 pence, which makes fifteen shillings.

2. French Miniatures.

2. It is from a French source that the earliest representation of a watermill we have as yet discovered is derived, this occurring in a twelfth-century

Harl. MSS., 334, 71b.

Walled City and Watermill.—*From Twelfth Century MS.*

MS. in the Harleian collection, *L'Image du Monde*, a treatise on natural philosophy, by Gautier of Metz: the scene representing a city with a watermill on

* Idem quod molinum sive molendinum (*Heringius*).

VII. EARLY CONTINENTAL.

2. French Miniatures.

its outskirts. The sketch, as it is the earliest, is the crudest of which we are aware; but it serves to indicate the mill as enclosed in a roofed hurst, with an exterior vertical water-wheel of Roman type.

Cott. Cleop.: xi. 10.

A thirteenth-century watermill appears rudely sketched in a MS. in the British Museum — *Liber Anselm qui dicitur Apologeticum* — the wheel being of the ordinary undershot form, and supplied with water from a conduit trough.

A fourteenth-century miniature in the Bibliothèque Royale contains a drawing of the mills then beneath Great Bridge, Paris. It has already been shown that in the year 1258 floating mills were established at this particular place. The MS. in question, however, depicts only structural mills built on the piles or esterlings beneath the arches of the bridge; with small ferry-boats in attendance. As

Text: p. 65.

Mag. Pittor. Paris, 1846, 217.

Millers' Bridge, Paris—*From Fourteenth Century MS.*

the miniature was executed in the reign of Philip de Valois, or about the year 1345, it appears that by this time the floating mills had disappeared, and it is probable that they were destroyed when, in 1296, Great Bridge was swept away by floods. The bridge was

rebuilt mainly by the contributions of the millers who were so much interested in its preservation, being afterwards known as Pont aux Meuniers (Millers' Bridge), and apparently the opportunity was taken to replace the floating mills by the fixed structures shown in the drawing. The mills are seen to be of Roman type, with vertical water-wheels. A description, or rather an inventory, of the plant and machinery of these mills, drawn up May 15, 1408, is printed with all its archaic rendering of technical terms by Fagniez; and in this it is possible to identify almost the whole of the working parts with those of the ordinary water-mill of the eighteenth century.

Études sur l'Industrie: Paris, 1877, 15.

A singular fortified watermill of the fourteenth century at Bagatz, France, built in 1316, and still grinding, is described and illustrated by the architect Viollet le Duc. The building is of three stories, the lowest being guarded by iron-bound doors, which can only be reached at one point from the land, or otherwise by boat. The walls are pierced by loop-holes, and formerly the roof was crenellated. The water runs under the lower storey, which of course contains the water-wheels. The second storey, like the first, consists of one large room, reached from the outside by a timber bridge, one section of which can be drawn into the mill. The third storey differs from the second only in having four corner towers well supplied with loopholes. A chimney runs through the entire three storeys, in only one of which is a fireplace.

A French MS. of the fifteenth century in the British Museum, containing an elaborately illuminated view of the city of Babylon in the time of Alexander the Great, illustrates another early variation in the method of constructing watermills. The MS. is a pictorial *Genealogie du Henry roy de France et d'Angleterre*, and the reference to Babylon occurs in the life of Alexander, from whom King Henry's

VII. EARLY CONTINENTAL.

2. French Miniatures

descent is traced. At the period named (360 B.C.) watermills were altogether unknown, and Babylon was using the saddle-stone and mortar for the reduction of grain: "the mills of Babylon" being of course sketched from some French mills of the fifteenth century. In the miniature is once again seen, as in the fourteenth-century illustration already described, the city of Babylon, with Nectanebus within a Gothic edifice seated on his throne: the gardens of balm again appear on the island in the Euphrates; but stretched across the river from the island to the mainland, where in the earlier drawing the floating mills were stationed, now appears as "les moulins de Babilonie" a black and white timber erection, with red-tiled roofs standing upon piles in the stream.

Text: p. 64.

Roy 15 E vi. 4b.

"The Mills of Babylon"—*From Fifteenth Century MS.*

Beneath the structure, as though between the arches of a bridge, are three water-wheels of a peculiar barrel-like shape, resembling the eighteenth-century water-

See also Frontispiece.

VII. EARLY CONTINENTAL.

2. French Miniatures.

wheels of the floating mills on the Tiber. The pinions driven by the wheels are seen to be of the usual medieval type, being smaller than the drums driven by the water-wheels themselves, as Vitruvius originally described them.

An example of a French mill erected on piles still exists at Chartres ; its foundations, stated to be several

North-Western Miller 1896.

Ancient Mill on Piles, Chartres.

centuries old, are quite sound, and the wheel is ordinarily turning, grinding grain for the peasantry of the country-side. Mills so built were valuable on streams subject to heavy floods or on tidal rivers, but their necessity passed rapidly away, and at the present day they are very rarely met with.

3. Bohemian Laws.

3. The early laws of Bohemia, also testifying to the use of watermills in that region, prove them to have been public institutions, always standing open for the use of all comers, as do the Norse mills of the Shetlands to-day :—

VII. EARLY CONTINENTAL.

In Ecclesia vel infra curtem Ducis vel infra Basilicum vel in Mulino aliquid furaverit, triujungeldo componat, quia istæ quatuor domus casæ publicæ sunt et semper patentes.

Whoso shall steal anything from the Church, the Court of the Duke, the Common Hall, or the Mill, shall be fined three hundred gulden; for those four are as public buildings, and always open.

3. Bohemian Laws.

Leges Bajorum tit. vii. cap. 2

An old Bohemian chronicler quotes the year 718 as that of the introduction of water-milling in that country, but his testimony is very doubtful. With watermills on the Moselle and other places in 380, they are very unlikely to have remained unknown in Bohemia for over three centuries; moreover, the chronicler declares that windmills had been used there before water power was adopted, and this, according to all credible evidence, was four centuries before windmills were invented. His statement as a curiosity may be cited, though the matter is again referred to in connection with windmills :—

Chron. Bohem. Wences. Hage.: 1697, 23.

At the same period, the year 718, one named Halek, the son of Uladi the Weak, built close to the city an ingenious mill which was driven by water. It was visited by many Bohemians, in whom it excited much wonder. Taking it as a model they built others of a like kind here and there on the rivers. Before that time all the Bohemian mills were windmills erected on the mountains.

4. Lombard Laws.

4. The early laws of Lombardy again take cognisance of the necessity of protecting the watermills :—

Leg. Longob.: tit. 19, c. 5.

Si quis molinum alterius scapularis aut clausuram ruperit sine authoritate, judicis componat solidos XII illi cujus molinum esse invenitur. Et si judicem interpellaverit et judex dilataverit ipsam causam deliberare, et licentiam dederit adversæ partei ipsum molinum evertendi, componat solid XX.

If any one break the shaft or sluice of a mill of another without authority, he shall be adjudged to pay twelve shillings to him whose mill it is found to be. If the matter be disputed, and the judge holds over the cause for deliberation, and give a decision against the party who destroyed the mill, then he shall pay twenty shillings.

Ibid.: tit. 19, c. 4.

Si quis molinum alterius asto animo incenderit, in triplum eum restituat, sub æstimatione pretii, cum omnibus quæ intus cremata sunt.

Any one wilfully firing the mill of another shall pay, by estimation, three times its value, and the value of everything burnt in it.

CHAPTER VIII.

INTRODUCTION INTO BRITAIN.

VIII. INTRODUCED IN BRITAIN.

1. Norse.

1. It is already evident that, exclusive of the floating mill, two different types of watermill were in existence shortly after the Christian era. In due course both of these were established in Britain as elsewhere; presumably, the older and simpler Greek or Norse type being adopted before that of Rome. Archæologists have frequently discussed the probable date of the establishment of the first watermills in Britain,* but not having distinguished the two varieties and the interval separating their invention, have not arrived at any unanimous or definite decision. We purpose briefly to gather together what evidences appear on the point, and note the theories derived from them.

It has been claimed that the British invented watermills, and the Romans pirated the idea from them.

> Implements of husbandry and every variety of wheel carriages were in general use before the Roman eagle visited these shores, and the watermills by which the Britons ground their corn must have created as much astonishment as the war-chariots by which they mowed down their enemies. . . . It is a remarkable circumstance that the first idea of a watermill was promulgated in Italy soon after the return of Julius Cæsar from Britain, when the internal condition and resources of the country had been laid open to the ambitious views of Rome. It was during the reign of Augustus that the agency of water became the subject of speculation in domestic economy; and this suggestion must have received its origin not in the eastern,

Britain under the Druids: Arch. Camb., 1850, supplement.

* The learned Adam Smith was obviously widely in error in stating that "neither wind nor water mills of any kind were known in England so early as the beginning of the sixteenth century, nor so far as I know in any other part of Europe north of the Alps."

Wealth of Nations, 1811, i. 345.

VIII. INTRODUCED IN BRITAIN.

1. Norse.

but in the western part of the Roman Empire, where, in Ireland, to which the Romans never penetrated, the watermill was known. Vitruvius, in his work on Architecture, particularly describes the machinery of a mill; and a Greek writer of the same Augustan period, Antipater of Thessalonica, dresses up the same idea in an epigram. . . . The simple expedient of applying a cog to the British rhôd or axle of carriages would speedily lead to the invention and use of the water-wheel. The British Triads afford direct testimony in confirming the probability that the original construction of water-mills was peculiar to Britain, and the result of British ingenuity; and that it was thence that Vitruvius derived the idea on which he established his theory (without, however, putting it into practice) of a water-wheel for grinding corn. One of these Triads enumerates the names of bards and Druids eminent for their skill in handicraft, one being Coel ap Cyllin, who is said to have been the first to apply the principle of the wheel and axle to the working of the cornmill.

The objections to which this theory is open may be shortly summarised. If watermills were developed from axles and wheels of carriages, there was no reason why the ancient Egyptians, who had possessed wheeled carriages in abundance, should not have invented mills. The first idea of a watermill was not, as stated, promulgated soon after the return of Julius Cæsar from Britain, but about forty years before by Antipater of Thessalonica. It is correct that Vitruvius wrote his account of the mill after the return of Cæsar, but he cannot be accused of "dressing up" the principle of any British mill; since—if the British had then any watermill at all—they had certainly the Greek or Norse mill, and it was not this, but an altogether different and new machine, which Vitruvius described. The theory, in fact, is based on the idea that there was but one watermill, whereas there were two; and while ignoring the claims of Greece to the one, it denies that of Rome to the other. Perhaps it will be agreed that if, as already shown, horizontal mills were new to Greece in 85 B.C., and vertical mills were new to Rome in 20 B.C., neither one nor the other is likely to have been common in barbaric Britain in 55 B.C. Further, both watermills were mere adaptations of the revolving quern; and since it appears to be the

VIII. INTRODUCED IN BRITAIN.

1. Norse.

fact that the British knew nothing of querns before the arrival of the Romans, they apparently had then no idea of applying circular motion to a grinding stone, and therefore knew nothing of water-milling.

An ancient Welsh authority, Iolo Morganwg (the writer of a chronicle of national events), is stated to declare that watermills, as well as windmills, supplanted the use of handmills in Wales in the year A.D. 340. This much later approximate period seems, however, as fallacious as the earlier one. It is true that Rome was then on the eve of adopting watermilling, and Britain may perhaps have gained some knowledge of it; but the whole statement of Morganwg is discredited by his allusion to windmills, which were nowhere known for over eight centuries after the year 340, when he says they were in use in Wales.

Arch. Camb., 1850, ibid.

The same claim to the origin of the mill has been made on behalf of Ireland. Some Irish archæologists seem to take it for granted that watermills must have been introduced into Ireland by Roman ecclesiastics, or, at all events, from some country subject to Roman sway; others, on the contrary, claim that the watermill was native to Ireland, having been known there before the landing of the ecclesiastics in the fifth century. Among ancient legendary lore of the Sister Isle are many traditions of early watermills, the first of them referring to the establishment of a mill at Tara (whose "halls" the patriotic Moore has immortalised) by King Cormac in the third century. Cormac possessed among his various retainers a beautiful bondmaid, Ciarnad, whom the queen condemned to the impossible task of grinding by hand nine quarters of corn a day; this heavy toil being calculated not only to weary out the unfortunate maid, but to keep her safely employed in the bakery the whole day through. Cormac discovering the *ruse*,

Kilkenny Arch. Soc.: i. 156.

VIII. INTRODUCED IN BRITAIN.

1. Norse.

and immediately taking measures to circumvent her Majesty's intentions, despatched messengers across the sea to, as some say, Scotland, to bring mechanics who could build a watermill: and in due course the first mill ever erected in Ireland stood "on the stream" of the Nith; and the baffled queen had no further excuse for compelling the fair Ciarnad to grind by hand. The one defect in the *bona fides* of the tale is that it was not in the third nor till the eleventh century that the story was written, occurring then among the rhapsodies of the poet Cuan O'Lochain upon the ruins of Tara, as he saw them about the year 1020; and only those who accept Cuan as an authority on chronological history can accept the fact as he gives it. At all events, this seems to be the earliest date claimed for any watermill in Britain. It is not actually impossible that Norse mills may have been known in the third century in Scotland, whence came Cormac's millwright; since the Greek mill was then four centuries and the Roman three centuries old. On the testimony of Ausonius and Palladius already quoted, one or other form of mill was certainly known in central Europe in the fourth century. Thus, though improbable, it may be that the Greek or Norse mill had reached Britain by the third century, the mill of Cormac (if it existed) appearing to be such a structure. But whatever the date of the erection of the latter, "ancient Irish authorities all agree in stating that this was the first mill erected in Ireland; and it is remarkable that the circumstance is still most vividly preserved by tradition, not only in the neighbourhood, where a small mill still occupies the site, but also in most parts of Ireland."

Text: II. 2.

Ord. Survey, Londonderry, 1837, 215.

To this inconclusive evidence it remains to be added that relics of horizontal mills, found in Ireland as in Scotland, are also valueless as to the period of introduction. Archæologists do not attempt authori-

VIII. INTRODUCED IN BRITAIN.

tatively to date them earlier than the Saxon period in England; and though there had without doubt been mills at an earlier date in this country, still these particular remains are not likely to appertain to them. Further, speculation is not quite extinct upon the possibility of the mill having been introduced into Ireland in that remoter period still when, as tradition avers, colonists from Greece established themselves in Hibernia. "A colony of Nemedians from Greece, named by the chroniclers the Tuatha-de-Danaan, arrived on the Irish shores and deprived their predecessors of the sovereignty: these Danaans, during their residence in Greece, had become extraordinary proficients in necromancy, and they carried their mysterious arts to Norway and Denmark, where they first settled, and where they established several schools of magic: from Scandinavia they sailed to Scotland, where they remained a few years, and then proceeded to Ireland, of which they became sole masters." It is thus not exclusively upon Roman influence that theories of the introduction of the mill into Britain rests.

1. Norse.

Hist. Ireland: T. Wright, i. 9.

The sum and substance of the deductions to be made from these various speculations is that it is impossible to go beyond the merest surmise as to how or when the horizontal mill reached Britain. It seems clear that the Romans did not introduce the Greek mill here, for, as will be seen, they do not even appear to have troubled to establish their own better and more powerful mill in the country; the controversy thus narrows down to the speculation that it was as "the Norse mill" that the machine was first known to the Britons, being probably introduced by the Teutonic tribes who overran these islands in the fifth century.

2. Referring to the Roman mill, it seems evident that it is not till after the year 398, when Rome

2. Roman.

VIII. INTRODUCED IN BRITAIN.

2. Roman.

abandoned her old conservative custom of using slave and cattle mills, and adopted water-power at home, that she can reasonably be supposed to have troubled to introduce watermills in her distant provinces, of which Britain was one. It will be remembered that she had no direct interest at any time in so doing, since Roman tribute was payable in grain, not in milled flour. If, therefore, the Romans be considered to have established watermills here at all, they must be assumed to have done so not earlier than A.D. 398 and not later than A.D. 448, when they abandoned Britain and left their stations, throughout the country, studded with the discarded quern-stones with which they had ground their grain by hand. Thus Roman mills in Britain, as old as the period of Julius Cæsar, Agricola, or Severus, are to be accounted impossibilities.

It is somewhat curious to consider that among all the numerous and varied relics of Roman handiwork discovered in Britain, there is (with one doubtful exception) no record of the discovery of a mill built by them. In itself this circumstance proves little or nothing, as mills, if erected by the Romans, would usually be preserved and worked, restored and rebuilt, time after time, by Danes and Saxons alike, till finally nothing of the original structure remained. Yet at times we must imagine that some such mills, if they existed at all, would have been thrown down or abandoned; and their relics have become covered with surface soil, precisely as have those of the camps, villas, baths, and roads, which are of so frequent occurrence. The negative evidence this paucity or absence of relics affords cannot be overlooked, when we remember that it is purely a popular assumption that watermills were ever erected in Britain by Roman hands or in Roman times. The exceptional instance of a supposed discovery of a Roman watermill is that stated to have

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2. Roman.

been made at Knott Mill, Manchester, in the last century, by the local antiquary Whitaker:—

History of Manchester: Whitaker, 1771, ii. 216.

> The watermill at Manchester was fixed immediately below the Castle field, on the channel of the Medlock (over a mile distant from the site of the manorial mills of the town). There, a little above the ancient ford, the sluice of it was accidentally discovered about twenty-four years ago (in 1747), on the margin of Dyer's Croft. The current of the river, accidentally swollen by the rains and obstructed by a dam, broke down the northern bank, swept away a large oak upon the edge of it, and disclosed a long channel in the rock below. This I have since laid open in part with the spade. It appeared entirely uncovered at the top, was about one yard in width and another in depth, but gradually narrowed to the bottom. The sides showed everywhere the marks of the tool, and the course was parallel with the channel. It had been bared by the flood about twenty-five yards in length, but it was evidently continued for several yards farther, having originally begun, as the nature of the ground evidences, just above the large curve in the channel of the Medlock.

Viewing all the circumstances, Whitaker believed himself justified in considering the conduit to have been the race of a Roman watermill, but no confirmation of the theory was made by discovery of any relics of the mill, though as late as the seventeenth century a mill certainly did exist at or near the spot.

Stones, commonly termed "Roman mill-stones," again, are not rare in archæological discoveries. It is true that such stones are of Roman type, that is, they are circular or disc-like in form, and are regularly furrowed, as in the stone of, presumably, a quern, on the monument to Antoninus Pius. But we have not been able to trace any undoubted record of the discovery of a power-mill stone among actual Roman relics; and all that can safely be said of those which have been found is merely that they are of Roman type, and may even have been fashioned for Danish or Saxon mills long after the Romans had left Britain. An apparently authentic instance of such a discovery occurred at the Roman Station, Adel Mill, Yorkshire, early in the last century, the incident being first mentioned in 1702. Thoresby, historian of Leeds,

Phil. Trans.: iv. 718, No. 282.

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early in the present century, again mentions it, stating that several "mill-stones" (which admittedly were quern-stones) were discovered; and adding, "Besides these I have fragments of another dug up at the same place; it is about three inches thick at the centre, but is not convex as the other two are, and has rows [furrows] yet remaining on it." Such a description, however, applies exactly to the lower stones of numerous Roman querns, which are almost flat, as already described. Various of these so-called "mill-stones" prove on investigation to be stones of querns. Among many instances which might be cited, one of the latest is that of the discovery of a portion of "an old mill-stone" in the ruins of a Roman villa near Dartford; but from a photograph kindly forwarded to us by Mr. S. K. Hayes, miller, Dartford, the stone is readily perceived to be a portion of the top stone of a quern, containing a part of the broken socket in which the handle had been placed.

2. Roman.

Ducatus Leod.: 1816, 160.

Text: I. 137.

The whole of the evidence at present available, seems, in short, to lend no support to the theory that the Romans introduced any watermill into England. However, in due course the mill of Vitruvius certainly did reach Britain, and was extensively adopted throughout the kingdom by the Saxons: displacing its early forerunner, the Norse mill, except in the more distant and secluded parts of the country, and remaining the model for all future developments of every variety of power-mill; the earliest known reliable allusion to any mill in Anglo-Saxon England occurring in the year 762.

Text: p. 97.

3. Mythical Irish.

3. In Ireland the legendary earliest mill, that of Cormac, built by a Scotchman, has already been mentioned. The first authentic mention of a mill in Ireland is stated by the eminent archæologist, Dr. Donnovan, to occur in the year 651, when, as related by Tigernach, the two sons of Blamach were mortally

Dublin Journal, 1849, vol. i

3. Mythical Irish.

wounded in a fray at Maclodran's mill. Another legendary mill of about the same period is that mentioned in "The Book of Ballymote" as the twenty-third wonder of Ireland — an establishment which introduces to us a series of the miraculous mills of the sister isle. This mill of Cell-cheise (founded by St. Fechin, who died in 664) would not grind on the Lord's Day, while so sacred was it that no woman was permitted to enter therein. The Hibernian historian, Geraldus Cambrensis, writing as late as about 1188, relates in some detail these and similar marvellous attributes of mills :—

In Media apud Foveram est molendinum quod sanctus Phecinus in latere cujusdam saxi miraculose nimis manibus suis exsculpsit. Hoc, sicut et ecclesiam sancti istius, mulieres non intrant. Nec in minori reverentia molendinum istud ab indigenis quam una ecclesiarum sancti ejusdem haberi solet.

In Meath, at Fore, is a mill, the stones in the walls of which were miraculously quarried by St. Fechin with but his hands. Thus this mill, like the church of the abbey, no woman might enter; and not in less reverence have the natives been used to hold the mill than the church.

Topographia Hibernica : lj. lij. liij.

The account given by Geraldus of the milling services rendered by St. Fechin differs somewhat from that of other chroniclers, who say that the worthy man happened to build his mill a mile from any stream, but afterwards, during an altercation on the subject with his astonished carpenter, threw his saintly staff into the distant stream, with the result that the stick borne down by the current smashed its way through adjacent rocks, and made a new channel by which the rivulet happily reached the hitherto high and dry mill.* It is at all events acknowledged that St. Fechin did

Roy. Soc. Antiq. Ire., xxii. 10.

* Not a more miraculous feat than that accomplished by St. Anthony, who, desiring to cross the Levant and reach the interior of Russia, adopted a huge millstone as a raft, and upon this safely accomplished the voyage; afterwards utilising the stone as a vehicle and travelling upon it to Novgorod, where he speedily converted the amazed pagans. In the cathedral of St. Sophia, Novgorod, a church attached to he monastery founded there by St. Anthony, the millstone was long preserved, and, says R. K. Porter at the commencement of the present century, "is regarded with the most devout reverence on account of the wonders attached to its history."

Travels in Russia and Sweden, 1809, 181.

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3. Mythical Irish.

establish Fore mill, and that, as Geraldus states, it would not grind on Sunday, nor would grind grain that had been either secretly filched or openly stolen in rapine and ravage. Further, the theft of corn from within its sacred walls entailed terrible consequences. Geraldus relates that one night a troop of horse soldiers staying at Fore stole out of the mill a quantity of grain belonging to the abbey. Hugo de Lacy righteously restored it, except a very small portion of oats which two troopers secretly reserved for their jaded horses. But that same night in the stable one of these unfortunate beasts broke its neck: and very early the next morning the other, as it was being mounted by its rider, who had made light of the sacred legend, fell suddenly dead at the feet of Hugo de Lacy; the greater part of the troop marching past and admiringly witnessing the dread spectacle. Still this wonderful mill was considerably inferior to the classic quern-stone that—as Pliny had heard—would turn round of itself: and the whole series of Hibernian milling marvels seem after all but hard matter-of-fact kind of prodigies compared with that of St. Alban of England, who in 1334 graciously restored to life a little English girl sadly drowned beneath the village mill-wheel in sight of her home.* Another saintly mill-builder of Ireland was St. Moling—a name, by the way, bearing a strong suggestion of "Saint Miller"—who spent eight years in building with his own hands a watermill at Carlow, but seeming to have refrained from exhibitions of any other

Text: I. 132.

Hist. Ang., i. 263.

* Walsingham, formerly a monk of St. Albans, as he proudly professes, relates the graphic story in his "History of England":—"This year a little maid of five years fell into the race of the mill at Bettlespool, near Redbury, and immediately was drowned. The mill was going at the time, and her body was swept under the rapidly turning wheel. Every one believed she was crushed and pulverised beneath it, but so far as injury from the wheel was concerned, it was found that she remained whole and unhurt, but dead. The neighbours thronged to the spectacle, beholding the mother weeping and bitterly lamenting her child. Unanimously, as they prepared the body for burial, and collected together their pence, they prayed to St. Alban, when, marvellous to relate, the infant began to revive, and in a short time her life was perfectly restored."

marvellous attributes than those of extraordinary patience and perseverance.

4. Brehon Laws.

4. The ancient Brehon Laws of Ireland furnish various interesting and curious references to mills, some of which, at all events, are shown to have been Norse mills, such as those whose relics still remain. These laws, ascribed in their origin to St. Patrick, were so greatly revered, that the ancient Irish judges—the Brehons—were not authorised to abrogate anything contained in them. They were administered in Ireland down to the reign of Henry II., when English enactments took their place, though even then they did not quite disappear, and were in force among some of the native Irish down to the reign of Elizabeth. Our extracts are selected from the transcript and translation of the entire code made by Dr. Donnovan from a MS. copy preserved at Trinity College, Dublin.

Ancient Laws of Ireland, I. 125, 144.

In the Senchus Mor, or Law of Distress, the various parts of a mill are mentioned in a clause authorising stay of execution for one day:—The eight parts which constitute a mill—muillond: the spring, the mill-race, the land of the pond, the stone, the shaft—mol, the supporting stone, the shaftstone, the paddle wheel, the axis—milaine, the hopper-cup comla: "the last so-called [says Dr. Donnovan] because originally the bondmaid was bound to mind it." A more detailed exemplification occurs in a subsequent clause, among the details included, in which are two which identify the mill referred to, to be the Norse mill:—"the little stone which is under the head of the shaft, and on which the shaft turns;" "the axis, the burden of the shaft is on it:" the enactment, obscure as it is, containing certainly a specification of the mill:—

For the eight parts which constitute the mill (*muillond*), *i.e.* the eight parts which are necessary to the mill, we shall explain. The spring, *i.e.* from which water comes; *i.e.* the water which is drawn from the spring and rests in the land of the pond. The mill-race,

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4. Brehon Laws.

i.e. from the spring to the pond. The land of the pond, *i.e.* the first requisite, viz. which is at the head of the water. The stone, *i.e.* the second requisite, viz. the upper stone. The shaft (*mol*), viz. the third requisite; this is its own proper name. The supporting stone, *i.e.* the fourth requisite, viz. the lower stone. The shaft-stone, *i.e.* the fifth requisite, viz. the little stone, which is under the head of the shaft, and on which the shaft turns. The paddle-wheel (*oircel*), *i.e.* the sixth requisite, viz. over its paddle the water flows. The axis (*milaine*) *i.e.* the seventh requisite, viz. the burden of the shaft is on it, *i.e.* the gamul. The hopper (*cuɫ*), *i.e.* the eighth requisite, viz. it drops the corn out of itself into the upper stone, *i.e.* the tual, *i.e.* the perforated iron. The comla, *i.e.* they are all in place of a bondmaid to a person, *i.e.* the whole mill, *i.e.* the mill common to them all. For the bondmaid was bound to mind it; she was bound to mind everything of these which a person wished; or everything that one has which is worth a cumhal is entitled to a gate (*comla*) to protect it, *i.e.* the whole mill.

Ibid.: III. 281, intro. lxxvii.

The laws of the Book of Aicill, supposed to confirm those of King Cormac, 227–266 (though "the date at which they were collected and commented upon is a very different matter"), allot in some detail various responsibilities for accidents in mills:—

Of Grinding at the Mill.—If the millstone should slide off or break without the knowledge of any one, it is then as if the sledge should slide off the anvil. There are three concerned, viz., the millwright, the man who is grinding his corn, and the miller. If the miller knew there was any danger, he is forthcoming for any trespass done. If the millwright and the man who is grinding his corn fear anything to happen, the man who is grinding his corn is answerable for any damage done afterwards and the millwright is free.

Why is the first sliding of the millstone a trespass here, and the first sliding of the sledge not made a fine in another part of these laws? The reason is, the mill is turned by water, the sledge by hands of man.

If the miller, the millwright, and the man whose corn is grinding be present, and the miller knew there was any danger, he is answerable for all damage. If the miller be not present, whether he knew there was danger or not, and the millwright be present knowing that there was danger in regard to his own work, he is answerable for any damage that shall happen.

Why is the man whose corn is being ground charged here for a trespass, and why is the other man not charged? The reason is, the man whose corn is being ground made no obstacle, and took upon him to be under any damage that might happen.

The miller is free if the rest consented to go on with the grinding. The first sliding of the stone is not to be charged to any. If the millwright should leave the mill in bad order after him, he is to

pay all the debt or damage, and if any mischance should happen by the strength of the water when the mill is not in bad order, the miller then is to pay all the fines.

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The mill-owner is exempt from liability for injury to a person caught between the millstones, whether the person is present of necessity or without necessity. In the first slipping of the millstone there is exemption as to every one injured; or else indeed it may be one-third of compensation in the case of the first slipping for injury to every one who comes to grind, and who is regarded as a fellow labourer; and compensation for the second injury; and half fine with compensation for the third slipping, and full fine with compensation for the fourth slipping. And the slipping is always like a first slipping if the millstone was fixed each time. And if an accident happen because the millwright left the stone badly arranged it is he that pays all these fines; if, however, it be the too great force of the water and not the bad arrangement of the stone that caused the accident, it is the mill-owner that pays all these fines.*

Among the miscellaneous laws are various enactments indicating the care exercised regarding mills:— Ibid., iii. 192.

Every unnecessary article left in a kiln, a kitchen, a forge, or a mill, shall be forfeited—in discouragement of the secretion of stolen property.

Notice of a waif of the land should be sent to the seven quarters which the law specifies—to a king, to an airchinnech dignitary, to a farmer, to a brehon, to a chief smith, to the mill—muillend—of the territory, and in presence of the people of one fort and one village.

There are seven ditches, the injuries done by which shall not be paid for: the ditch of a "dim," fort, the ditch of a "cill," church,

* A couple of later Scotch whimsical dicta for responsibility for accidents occur in *Regiam Majestatem* of the beginning of the fourteenth century, as translated into the vernacular by Skene in 1609:—

Of ane milne and ane man slane with the quheill thereof.—It is to witt that this question is asked in the law. Gif ane lord hes ane milne, and any man fall in the damme and be borne down with the water-quheil and he come to the quheil and there be slaine to death with the quheill: quhither aught the milne to be escheat or not? The law sayes thereto nay, and be this reason: for it is ane dead thing, and ane dead thing may do na fellany, nor be made escheat throw their gilt. Swa the milne in this case is not culpable, and in the law it is lawfull to the lord of the land to have ane myln on his awin water quhere best likes him.

Merrie questioun anent the burning of a milne.—Gif it happin that ony man be passand in the king's gait or passage, drivand befoir him twa sheip festnit and knit togidder, be chance ane horse havand ane sair bak is lying in the said gait; and ane of the sheip passis be the ane syde of the horse and the uther sheip be the uther side; swa that the band quhairwith they are bund twich or kittle his sair bak; and he thairby movit dois arise and caryis the said sheip with him heir and thair, untill at last he cumis and enteris in ane milne havand ane fire without ane keipar, and he skatteris the fire quhairby the miln, horse, sheip, and all is brunt: *Quæritur*—Quha sall pay the skaith? *Respondetur*—The awner of the horse sall pay for the sheip, because his horse sould not have beyn lyinge in the king's hie streit or common passage; and the millar sall pay for the miln and the horse, and for all uther damage and skaith, because he left ane fire in the miln without ane keipar.

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the ditch of a fair green, the ditch of a mill-race, the embankment of a mill-pond, the ditch of a turf bog, a ditch which is at the bridge: these are lawful constructions.

4. Brehon Laws.

There are cuttings which are not sued for, and they bring no claim of debt upon the person who makes them: a cutting for carriage at the construction of a mill, or of an oratory, or of a shrine, or at the building of a king's "dun," fort. Leave is asked about them all: permission to do everything of these is asked for of the owner of the land: for it is an old maxim with the Feini "every supplication is pleasant."

Ibid., iii. 391.

When a man has the site of a kiln or of a mill of rightful land, or when he shall purchase such, it makes a native freeman of him

Text: II. ix.

[an almost identical statute with one of the Anglo-Saxons, quoted elsewhere].

Respecting right of water for driving mills, Dr. Donnovan remarks:—

Whenever a mill was to be erected for the use of neighbours, it was left to the option of the persons concerned (who were generally the inhabitants of the three nearest lands) whether they would all join in constructing the works and conducting the water thereto, or let all be done by one man, who was to pay his neighbours for conducting the water through their lands. If the neighbours had assisted in forming the mill-pond, mill-race, and other works, they were entitled to certain days' grinding at the mill, according to their respective positions on the land through which the water was conducted. They were technically distinguished, like the different branches of the family of a chieftain, by the terms "gelfine," "derbhfine," "iarfine," and "imifine." The "gelfine" were those in whose lands the source of the water was (which source was not always the actual fountain of the stream, but the point at which the water was turned off for the use of the mill). The "derbhfine" were those who dwelt on both sides of the mill-leat, or embankment, extending from the point where the water was turned off, to the pond. The "iarfine" were those around the pond. The "imifine" were those who resided on both sides of the stream below the mill, until it flowed out of the land of the parties concerned. Each of the parties through whose lands the water was conducted, was entitled to certain days' work at the mill in their turn, according to the above classification; but if they did not choose to be paid by the work of a mill in grinding their corn, the owner of the mill paid them to the amount of sixty "screpalls," to indemnify them for the injury done to their lands by the channel and embankments necessary to conduct the water to the mill. The price was paid to each in proportion to the value of his land, for the contemporary commentator says that ten "screpalls" were paid for arable land, even if the water had been conducted only over a foot and a quarter of it. The mill was of such importance to the neighbourhood that none of them could prevent the conducting of water to it when the price was offered.

The foregoing lucid commentary on the subject of water rights is preferable here to the detached and not very intelligible clauses of the law itself, but the following sections are also of interest :—

Every co-tenant is bound to permit the other co-tenants to conduct drawn water across his border, and if it be purchased, its price is fixed at one sed, worth ten screpalls, for every farm over which it is carried. If it be arable land, then though the water should pass through half a step of it, it shall be paid for after that manner. But if it be unprofitable land, then half a sed is its price. Otherwise it is a day at the mill for every land over which it passes that is due for it.

There are three lands which are not entitled to price, and for which nothing is paid for conducting water through them, viz., land on which a mill stands so that it yields produce; a house which has not water to serve it until it is led to it; a trench that is empty in dearth of water floods.

In amplification of the law upon "Eighteen days complete are in the rotation at the mill," some ancient transcriber has penned on the top and bottom margins of the MS. the following order of the annual services of tenants due at the mill and elsewhere :—

Monday to the well, a pleasant deed ;
Tuesday following, to the pond :
Wednesday and Thursday prosperous assignments
Are given to the artisans :
Friday and Saturday, fine the arrangement,
Are assigned to the attendance :
This is the peaceable ordering,
The proper distribution of the first week.

Monday and Tuesday, sweet remembrance,
To the lands as far as the pond,
And from the pond out,
A different one does not occur.
Wednesday, Thursday, of wonderful work,
In this week go to attendance.
Friday and Saturday of mention least
To the artisans who superintend.

The third week for every work.
Monday and Tuesday are given to the pond,
Wednesday and Thursday not slavish of their fame,
Give the artisan this turn.
Friday and Saturday constant custom
To attendance give the last.
Eighteen days of fervid work.

This is the extent of the entire rotation
Without mill-tribute for its grinding ;
It is distributed as it was above distributed,
The distribution is thus, unless they sell it for "seds."

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5. Welsh Laws.

Text: I. 161.

5. The ancient Laws and Institutes of Wales, codified in the ninth and tenth centuries, contain not only the allusions to querns already quoted, but some references of considerable interest to watermills; the code no doubt comprising some of those early British laws which the Welsh carried with them on their retreat to their mountain fastnesses. These enactments show a watermill to be a valuable possession, to be treasured as an inheritance :—

Ancient Laws and Institutes, bk. ii. ch. xvi.

A mill, a weir, and an orchard are called the three ornaments of a kindred, and those three things are not to be shared or removed, but their produce shared between those who have a right to them.

The same inalienable right in these three possessions is expressed also in the Welsh Anomalous Laws of uncertain date :—"these are to be common among brothers, an orchard, a mill, and a weir;" * and in such enactments may clearly be recognised that jealous care exercised over mills as profitable undertakings, which ere long established for their owners the special privileges known as "milling soke."

Bk. xiv. c. xxxi.

Text: I. 162.

The Venedotian code contains the legal valuation already incidentally quoted :—"the worth of a mill is one pound;" another assessment being "for the hurst thirty pence, the timber thirty pence, the mill-irons [the 'ferramenta' of Salic and other laws] sixty pence, each stone thirty pence." The Dimetian code contains the entry, "a mill is six score pence in value and the fittings are to be appraised."

The Dimetian code furnishes a recital of the duties of the king's household servants, and introduces us to the important milling functionary, the smith of the court. He is to do all the king's work without pay, with certain exceptions; which are that he is to have the worth of his work on the king's cauldron, on the

* Much the same connection between these items of real property occurs in a continental Bull of Stephen III., dated 753—"Watermills and olive gardens and all that is his;" and again in a French charter of 1049, quoted by Du Cange—"Lands with orchards and olive gardens and sites of mills."

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iron fastenings of the king's castle gate, and on the irons of *the king's mill*—the first occurrence of a term subsequently made memorable throughout the country.* The smith, according to the Gwentian code of South Wales, was an exceptionally favoured personage, being declared entitled to "the same freedom in grinding as the king," that is, grinding gratis at any watermill; and in the preceding allusion to the smith, the term "king's mill" appears to refer literally to the mill at which grain was ground for the royal household, a mill of the court or hall as mentioned in Domesday.

Laws and Institutions: Ibid., bk. i. c. xxxviii.

Text: II. ix.

Another of these ancient laws of Wales provides against conflagrations at mills:—

Affinia incendi: pro molendino x solidi; pro domo annone id est granario x solidi et annonam quantum in ea sit reddere.

Fines for incendiary fires. For a mill, ten shillings; for a grain house, that is to say, a granary, ten shillings and as much grain as it contained.

Leges Wallice, lib. II. c. vi.

But the most interesting of the whole of these enactments is one of the "Anomalous Laws," which includes among the legal possessions of a lord upon his estate "the Toll of his Mills:" this being the

Laws and Institutes, bk. ix., c. xxiii.

* During medieval ages, when sovereigns possessed, as private property, numerous corn-mills throughout the kingdom, the term "king's mills" was a household word throughout the realm. In modern times the term still lingered in many places, but on the whole, as the royal interest in mills became alienated, the designation passed entirely out of use till its meaning had become forgotten. The obsolete name was in fact a trifle unknown even to Mr. Gladstone, who, referring to Mr. Bennett's paper on *The King's Mills of Ancient Liverpool*, read before the local Historic Society, wrote:—

Trans. Lanc. and Ches. Hist. Society, 1897, 29.

"HAWARDEN, *April* 30, 1896.

"DEAR SIR,—I thank you for your lecture, which I have perused with interest. I can supply a slight fact. My father had a ship named the *Kingsmill*, but I had never understood the meaning of the name. She was, if my memory serves me right, the first private ship that sailed to the East Indies, probably Calcutta, in or about 1812. I remember her running as late as about 1820. The origin of the name seems plain. It must be in the Custom House records, and may possibly supply you with some clue.—Yours very faithfully, W. E. GLADSTONE.

"R. BENNETT, Esq."

Mr. Gladstone's father had no connection with the king's mills of Liverpool. The ship *Kingsmill* was probably so called after Admiral Kingsmill, famous during the war with the French in the early part of the century; in honour of whom also, as we are informed by Admiral Wharton, hydrographer to the Admiralty, the Kingsmill Islands (now the Gilbert Islands) in the South Pacific were named by their discoverer.

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earliest definite pronouncement known in any British law of that privilege, designated "milling soke," which manorial lords afterwards possessed for many centuries; but which cannot be further referred to here.

6. Anglo-Saxon Charters and Laws.

6. The earliest mention of an Anglo-Saxon mill has been considered to occur in a charter dated 664. Strutt, who quotes an extract from this document, observes:—"It is almost certain that at this period there were watermills in England, as may appear from a prodigious number of charters wherein mills are mentioned as standing near rivers or bridges." He gives no information as to where the prodigious number may be found. The eminent Saxon scholar, Kemble, has printed over 1300 Saxon charters out of a total of 1500 known by him to exist in the great libraries of Oxford, Cambridge, and London; and among these we are able to trace fewer than a dozen containing allusions to mills.

Horda Ang. Cyn., II. 13.

Codex Diplomaticus Saxonici, 1839.

The charter of 664, above alluded to, is the foundation charter of Medeshamted Abbey, but is characterised by Kemble as of doubtful authority. It professes to have been granted by Wulfere, king of Mercia, for the endowment of Medeshamted with a church and a mill in each one of several hamlets, including Wermingtone, Undale, Aistonne, Churchfelde, Stanewigge, Irecelingeburge, Keteringe, Cottingham, Petelle, Ingethorp, Scalthorpe, Flettonne, Alewaltonne: the usual formula being:—

Codex Dip. Sax., V. 2.

Concedemus etiam villam de Wermingtone cum æcclesia et molendino et cum omnibus pertinentibus suis.

We grant to the abbey also the town of Wermington, with the church and the mill and all their appurtenances.

If this charter were of undoubted authenticity, its clauses relating to "appurtenances" might perhaps be adduced as early evidence of soke rights of mills.

No doubt is suggested as to the authenticity of the next of the charters we are about to cite alluding to mills, viz., one granted by Ethelbert of Kent, in

the year 762; and now constituting at once the earliest purely milling document in our records and the earliest tangible, if faint, evidence of milling soke:—

✠ In nomine domini nostri Jesu Christi. Possessio quædam est terræ in regione quæ vocatur Cert, monasterii scilicet beatorum Petri et Pauli apostolorum, quod situm est ad orientem civitatis Dorovernis. In hac autem terra habetur molina cuius quippe semis utilitas, id est dimidia pars molendinæ, a possessoribus præfati monasterii ac terræ huius ad villam regalem quæ vocatur Uuyth tradita est: pro hac videlicet conditione atque commutatione, ut homo ille qui hanc terram, in qua molina est, tributario jure tenet, unius gregis porcorum pascuam atque pastinationem in saltu Andoredo jugitur haberet. Hanc autem commutationem ego Æthelbertus rex Cantiæ, ut rata in perpetuum existat, signo dominicæ crucis roborare curavi, et testes religiosos ut id ipsum facerent adhibui. Actum in civitate Dorovernis anno ab incarnatione domini DCCLXII. Codex Dip. Sax. I. 132. MSS.: Aul. Trin., 55b. Harl. 686, 91.

✠ Ego Æthelbertus rex ut præfata commutatio atque donatio firma perpetuo existat, in nomine Dei omnipotentis quibusque dignitatis ac conditionis hominibus præcipiet et per crucem dominicæ passionis adjuro, cuius signum ad cumulum fermitatis in hac paginula descripsi.

✠ Ego Bregouinns, archiepiscopus, testis consentiens canonice, subscripsi.

✠ Ego Aldbertus præfectus subscripsi.

✠ In the name of our Lord Jesus Christ. There is a certain possession consisting of lands in the district called Cert, situated at the east of the city of Dover, which appertains to the monastery of the blessed apostles Peter and Paul. In this land the monastery has a mill of which it possesses half the usage, that is to say, half of the multure drawn from the land of the said monastery in the royal town called Hythe. Upon this condition and commutation, viz., that the man who holds, subject to the monks, the land in which the mill is situated shall have the perpetual right of feeding and keeping in the forest of Andoredo one herd of pigs. I, Ethelbert, king of Kent, in order that this commutation shall perpetually exist, and that the monks shall cause the same to be adhered to, have ratified it in their presence by the sign of the Cross of our Lord. Done in the city of Dover in the year of the incarnation of Our Lord, 762.

✠ I, Ethelbert, king, do solemnly swear that the abovesaid commutation and donation shall perpetually continue, in the name of God Omnipotent who perceives the rank and condition of all men, and by the Cross of the Passion of Our Lord; the sign of which for greater force I have marked on this [last] small folio.

✠ I, Bregovinus, archbishop, on behalf of the canons consenting, have signed.

✠ I, Albert, prefect, have signed.

VIII. INTRODUCED IN BRITAIN.

In 814, Côewulf, king of Mercia, grants certain lands and fields with one mill.

6. Anglo-Saxon Charters and Laws.

In 833, Witlaf, king of Mercia, grants to Croyland Abbey certain lands in Northlang, together with "the church of the said town and one mill, half of another mill, and all the fishery in the water of the said mill:" the charter confirming also a grant by Norman, formerly sheriff, of two caracutes of land and one windmill, in Sutton juxta Bosworth: duas caracutes terræ et unum molendinum ventricium. Kemble marks this charter as of somewhat doubtful authority, but its mention of a windmill proves, without doubt, the document to be a forgery executed at least three centuries after its professed date. It has been constituted a deed of some importance in this connection, and is further considered in the chapter upon early myths respecting windmills.

Codex, I. 261.

Ibid., I. 301.

Ibid., I. 317.

In 838, Eggberht, king of Wessex, grants "one mill in the torrent which is called Holanbeorges burna."

Ibid., II. 42.

In 851, Berhtuulf of Mercia grants "one mill and half another mill, and all the fishery in the water."

Ibid., II. 65.

In 858, Ethelbert of Kent grants "two mills appurtenant to certain lands, one at Wassingwellam and the other at Hwîteceldam."

Ibid., VI. 61.

In 963, King Edgar grants "one mill at Hirdegrafe with twelve acres of my estate appurtenant to the said mill:" án miln æt Hyrdegráfe and xii æceres landes portione pertinentem ad ipsum molendinum camerario meo.

These seem to be all the evidences at present to be obtained from the charters.*

Leg. Ang. Sax. Spelman, 1721: 199.

The voluminous codes of Anglo-Saxon laws appear to contain no reference to watermills till the late period of the reign of the Confessor (1041–1066), and then they are mentioned but twice. The first allusion

* We understand that among the mass of inedited ancient documents now being indexed at Westminster Abbey, some Saxon MSS. occur which, on investigation, may be found to add somewhat to the present available evidences.

has reference to encroachments by mills upon the four great Roman highways across the country :—

De pace regis. Si vero molendina, piscaria vel alia quælibet opera, ejus impedimentum facientia præparentur et chemini [quatuor chemini Watlingstrete, Fosse, Hikenildstrete et Ermingstrete] et aquæ ut fuerant primitus reparentur et forisfactura regis non obliviscatur. . . . Chemini vero minores de civitate ad civitatem ducentes et de burgis ad burgos, per quos mercata vehunter et cætera negotia fiunt sub lege comitatus sunt.

Of the peace of the king. If any mill, or fishery, or any other work whatever be so placed as to cause an impediment to the four highways—Watling Street, the Fosse, Ickenild Street, Erming Street—the roads and the waters shall be restored to their original condition, and the forfeiture due to the king shall not be overlooked. As to the minor roads leading from city to city, and hamlet to hamlet, by which merchandise travels and general business is conducted, they are under the jurisdiction of the sheriff of the county.

The other reference, in view of subsequent events one of some importance, declares mills to be subject to tithes and ninths in Anglo-Saxon times :— Text : II. ix.

De bosco de prato et equis molendinis [&c.] et omnibus rebus quas dederet dominus decima pars, ei reddenda est, qui novem partes simul cum decima largitur. . . . Hæc enim prædicavit beatus Augustinus et concessa sunt a rege baronibus et populo Leg. Ang. Sax., 197.

The lords of all woods, fields, waters, mills, and all other properties for which they pay tithes, shall now also pay, with the tithes, the ninths. This was suggested by the blessed Augustine, and it was agreed to by the king, barons, and people.

Augustine lived in the sixth century, and we have no actual evidence that British mills were in existence then. Apparently it is to be understood that Augustine had generally suggested an additional contribution of ninths to the Church, and it was not till the reign of the Confessor that mills had been added to the list. However, at the date of Domesday, or shortly after, mills were generally free from payment of tithes.

With the exception of these two fragmentary allusions, the Anglo-Saxon laws seem to be utterly silent regarding mills, while tradition and poetry are none the less oblivious concerning them. At this early stage, therefore, commences that dearth of milling references in English legislation which contrasts so

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6. Anglo-Saxon Charters and Laws.

strongly with their abundance in the laws of various other nations, and which, without reference to foreign feudal laws, renders the early history of British milling almost impossible to trace.

Referring to the mills of Anglo-Saxon England, Strutt observes:—"The form and construction of these ancient watermills would be esteemed a very curious acquisition, but unhappily no such thing can be traced from their delineations, or any description be found in the ancient historians, so that nothing satisfactory can be said on that head." It is, however, obvious that they were identical with the Norse mill and the Roman mill respectively, the form and construction of which are now both known.

Chron. of England, 1779, II. 219.

CHAPTER IX.

DOMESDAY MILLS.

IX. DOMESDAY MILLS.

1. The Survey.

1. DOMESDAY Survey, commenced in 1080, completed in 1086, affords us statistics of the milling resources of the kingdom of a more comprehensive character than has at any period since been effected. By this valuable national return, twenty years after the Conquest, we are definitely raised above the myths, doubts, and conjectures that up to this period invest British milling: and may survey and number the thousands of Saxon watermills scattered throughout the kingdom; may learn who owned them, and the terms on which they were rented; and may estimate at once both the smallness of the structures that dotted the face of the country and the largeness of the watermilling resources the kingdom at this early period possessed. Though Saxon legislators and chroniclers, so far as can now be traced, have been as silent on the topic as though not a watermill existed in the land, and though Saxon charters referring to mills are exceedingly few in number, yet the Domesday Survey reveals the fact that prior to the Conquest the country abounded with mills; the smaller streams with the trifling structures of Greek or Norse type, no doubt, and the river-courses with the more complete Roman mills. As the Survey takes little or no cognisance of the brief reign of Harold, the Saxon statistics which it contains are those of the period of Edward the Confessor: thus the Norman compilation is almost a survey of Saxon England,

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1. The Survey.

where were already in existence the greater portion of the numerous mills which the itinerant commissioners of the Conqueror scheduled. Sir Henry Ellis, editor of the modern national reprint of Domesday, observes, "no archives except those of our ancient ecclesiastical establishments throw light to any great extent upon the Domesday Survey;" but to the collateral light thrown by church history upon the state of the kingdom in 1086, may assuredly be added that insight which the archæology of corn milling now affords: and the church and the mill, systematically scheduled together by most of the commissioners of Domesday, thus literally remaining in close union in illustration of laws and customs of early Norman England.

Domesday: Dissert.: 1833, I. xix.

In view of the multitude of statistics and variety of information contained in the Survey, and the importance of the deductions thence to be derived, it appears necessary to say a few words as to the extent of reliability to be placed upon it. Modern ideas of strict arithmetical accuracy, exhaustive research, and exact specification, may perhaps incline to regard but lightly the results of the painful toils of the statisticians of the reign of William I. But whatever charge of general laxity in such matters may be levelled at some of our early monkish chroniclers, the compilers of Domesday are to be held exempt from doubt. The utmost resources of the Conqueror were brought to bear upon the production of a reliable return of the value of his newly-acquired kingdom; and no Star-Chamber inquisitors ever sat in greater authority or extracted evidence more rigidly than did the powerful commissioners who for six years traversed the kingdom to ferret out its worth to their lord the king. How the Survey progressed was evidenced at the time by the monkish annalist who compiled *The Saxon Chronicle*—"So very closely did he cause the Survey to be made that there was not a single mile nor rood

Saxon Chronicle: Survey: 1819.

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1. The Survey.

of land, nor, shameful to relate, not an ox nor a cow nor a pig that was not set down therein." Or as Sprott, the monk of St. Augustine's, Canterbury, writing about 1280, says—"He had put in writing how much land every baron possessed, how many retainers, how many caracutes of land, how many bondmen, how many cattle; the country being much troubled by the quarrels thence arising; and these descriptions were in a small tome placed in the king's archives at Winchester." And when concluded, so momentous an affair was the return regarded by the Conqueror that its completion served as a notable event whence dates might be reckoned: a charter of his still extant is granted—post descriptionem totius Angliæ: "after the Survey of all England."

Sprott Chron., W. Bell: 1851, I. xi.

Domesday of York: Bawden: 1809, 7.

The MS. record deposited, as Sprott says, at Winchester, and long preserved in the cathedral there; carried for safety about the kingdom by a later king; produced often in the law courts in evidence of title to estates; and finally deposited in London; is now preserved at the Record Office, Chancery Lane; and from the facsimile volumes produced at the cost of the nation, in 1833, by order of William IV., we may now derive valuable authentic statistics of mills and realistic glimpses of milling life in England over eight centuries ago.

Nor are these matters of only archæological interest. Just as "at the present day the proof of ancient demesne still rests with Domesday," so, as Sir Henry Ellis remarks, there are "other cases in which its evidence is yet appealed to in our courts of law, in proving the antiquity of mills and in setting up their exemption from tithes": a practical matter which is fully exemplified in a later part of this chapter.

Domesday, Diss., i. 353.

2. Of Saxon origin.

2. "The mill is an item of careful and particular survey in Domesday," remarks Canon Eyton; and, says Ellis, "wherever a mill is specified in Domesday

Dorset, 1878, 41.

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2. Of Saxon origin.

we generally find it still subsisting"—facts which enable us at this day clearly to identify numbers of watermills still existing in the shires as the direct survivals of Saxon foundations. Though hundreds of our present rural watermills must thus date from a period earlier than Domesday, we are aware of but one, which is now formally claimed to be of Saxon origin, to remain on the same site, and to evidence in some portion of its fabric Saxon workmanship; this being the restored "Saxon Mill" at Guy's Cliff Warwickshire.

Reputed Saxon Mill, Guy's Cliff, Warwick.

3. None in some counties.

3. The mills were of course most numerous in the more settled and thickly populated parts of the country, the south, east, and midlands. In the north the kingdom was thickly peopled with an unsettled race, only recently quelled by the Conqueror in a campaign, which had laid their country waste. Doubt-

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3. None in some counties.

less it was owing to this cause that we find the region extending northward from Cheshire but scantily surveyed, and apparently almost destitute of mills. Lancashire, not mentioned by name, is divided between adjoining counties: the district "between the Ribble and the Mersey" being included in Cheshire; and Amounderness and Lonsdale being scheduled as in Yorkshire; but not a mill is returned as existing in any of these districts. If mills did exist, it is difficult to imagine that, in these cases, any exception would be made to the ordinary rule of entering them in the return; for they were valuable properties, and without their inclusion no full valuation of estates was possible. The presumption must be that practically they did not exist; the inhabitants of the district being still too unsettled or too primitive to build them, or else their mills having been destroyed. The frequent entry—"waste," "was found waste," or "was and is waste"—appearing not only in Lancashire, Cheshire, and the almost unbroken stretch of ruined region from York to Durham, only too plainly suggests one cause of the lack of watermills. In Amounderness, in Lancashire, for example, it is stated that out of sixty-one villages in the neighbourhood of Preston, "sixteen of these have few inhabitants, how many is not known, and the rest are waste"; just as of Loctushun, Yorkshire, it is said that, whereas in the time of the Confessor, it yielded a rental of £48, it now pays nothing, and the list of hamlets it contains concludes with the remark, "they are all waste." In Lancashire the bare lists of little more than mere names of villages, which form a great part of the Survey, afford strong evidence that there was little of value, and practically no mills to schedule. So remarkable a general omission occurs in no other part than the north. In the more settled districts, indeed, they appear through the records with undeviating regularity; even the sites

Domesday: I. 301.

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of destroyed mills, as well as mills paying no rent, being as carefully entered as those yielding high revenues; and royal commissioners, who made such careful entries in certain counties, would certainly register in Lancashire the sites of even the ruined mills had the structures themselves been destroyed in the campaign of the Conqueror. Our impression is, therefore, that in this part of the kingdom, whether owing to the destruction of mills or otherwise, hand-mills were in ordinary use.

3. None in some counties.

4. *Re* Output. 4. Throughout the kingdom the number of mills actually returned affords no indication of the national demand for ground grain. What mills there were, were of slight power and doubtless indifferent regularity of working, so that, compared with their number, their output could never have been very great. On the other hand, there was as yet no general law or custom prohibiting the use of querns, which were no doubt largely used at every place where we find water-mills lacking. The actual number of manorial tenants mentioned in Domesday has been calculated to reach but a total of 283,242, these being heads of households, but in the greater number of manors the number of tenants is not stated; and thus again any attempt to estimate the population of the country, and thence gauge what may have been the approximate output of the mills, would be futile.

5. Other than Corn Mills. 5. There is no direct evidence that the whole of the mills mentioned were corn mills, and we can but remember that possibly some, though comparatively few, were devoted to other purposes. The mills of Lecheswrde (Somerset) at all events paid rent in metal: Ibi II. molini redd̄ II. plūbas ferri, these being on the land of Earl Eustace; two others at the same rental being in the same place on the land of Baldwin of Exeter, these apparently being mills used for stamping ore. Such mills, under the title of molendina

Domesday: I. 91b, 94.

IX. DOMESDAY MILLS.

5. Other than Corn Mills.

ferrea or m. fabrile, occur in charters, &c., quoted by Du Cange and Carpentier as early as 1311, and some such, no doubt, existed at the earlier date of Domesday; still in Cornwall, famous for its ancient mines, where mills of this kind might have been expected to have been tolerably numerous, none whatever are mentioned, and the total number of mills of any variety scheduled in that county amounts to only six. Probably also there was known at the time mol. ad tannum, the tanning mill (first quoted elsewhere by Du Cange in 1217); mol. pastellerium, the paint mill (1361); mol. reseguæ or de planchia, the saw mill (1376); mol. fullonarium or draperium, the fulling mill (1168): for though none of these are mentioned in Domesday, it is but reasonable to consider that some of them existed, and to some slight extent reduced the total number of the mills which are commonly regarded as entirely corn mills. What few evident instances occur are omitted from our lists.

6. Nomenclature.

6. It may be convenient here to mention that the abbreviated term "mol." is systematically adopted throughout the record; the original word "mola" having been converted into "molinum" and "molendinum"; as appears, for example, in the entries relative to mills at Arundel Castle and Tadeham in Sussex, in which the first named is used; and in the entry relating to Rudeford in Gloucester where the second term is adopted. "Molendinum," derived from "mola" and "domus," literally meant the mill house or hurst, as distinct from the actual mill itself. The pure ancient Latin word "mola" was still indeed frequently used in this and later centuries; *e.g.*, by Bishop Lucas Tudensis writing in the thirteenth century of the persecution of Christians in 880:—

Clausit nox obscurissima diem, et in un mola omnes Christiani conclusi sunt totam noctem in lacrymis et orationibus peragentes. Du Cange, 868.

Night closed a most gloomy day, and all the Christians secluded within a mill spent the whole night in prayers and tears.

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6. Nomenclature.

But the primitive simple term had then generally given place to various modifications at the hands of early medieval Latinists; in whose writings the mill is now to be recognised as molinum, molendinum, molinarium, molendinarium, molione, moletrina (the combined mill and bakery), molendinellus (a little mill), &c.; while the special variety, the watermill, the mola aquaria of the Romans, appears as aquimollea, aquimoli, aquismoli, aquimola, &c. These several aliases are ignored by the surveyors of the Conqueror, who usually enter "mol." a mill, the allusion being either to the horse-mill or the watermill: the windmill being as yet apparently unknown.

7. Rentals.

7. Money rentals varied greatly in amount. The lowest seems to be that of Cerfeli (Dorsetshire), which

Domesday: I. 50.

paid threepence per annum. Several are valued at

Ibid., I. 236b.

fourpence, as that of Pichewelle (Leicestershire), from which amount they run through various small sums, till the highest seems to be reached by three mills at Cambridge, averaging £3 each; though these were not necessarily the most valuable in the kingdom, as many mills paid a part only of their rental in cash. For mills in some parts of the kingdom, notably Essex, Suffolk, and Norfolk, rentals are not stated, the commissioners merely recording, "here is a mill," and including its value in the total revenue of the manor.

Most lords naturally preferred to receive mill rents in cash.* At Stibenbede (Stepney), the Bishop of

Domesday: I. 127.

London being lord of the manor, there are four mills worth £4, 16s. 4½d. per annum, and Hugo de Berners holds under the bishop, within the demesne, one mill of 66s. 8d. Often the amount is stated in

Ibid., I. 146b.

Saxon money: at Sigelai (Buckinghamshire) is one mill of five oras and four pence: v ores 7 iiii den',

* Domesday values are to be estimated at about $\frac{1}{115}$th of that of the present currency, a mill quoted at 1s. being worth £5, 10s. present money.

7. Rentals.

the ora being an originally Danish coin of computation variously estimated at from sixteen to twenty pence present money: Eastone (Bucks) paid five silver oras: v oris argenti. The mark is often mentioned: two mills at Sclostre (Gloucester) paid one silver mark: una marka argti. The Saxon mancusa, or mark, in silver, was of the value of six Saxon shillings: in gold its value is not precisely known, though in later times it was worth ten marks of silver. Money also being sometimes calculated according to its weight, not the number of its coins, we find mill rents occasionally paid in this manner; half a mill at Sarisberie (Wilts) paying twenty shillings ad pensum. Increased cash rentals are often scheduled. At Turberie (Gloucester) are two mills yielding 6s. 4d. in the time of Edward, but now increased by 8d.—modo accreuit p̃posit molin̄ ibi de viii den̄.

Ibid., I. 150b.

Ibid., I. 162b.

Ibid., I. 64b.

Ibid., I. 163b.

Wheat commonly constituted the whole or part of the rental. A few years later such wheat was equivalent to flour, since by one of the cardinal customs of manors the lord's household corn was stipulated to be ground free. There are many variations in corn rents. A mill at Arundle Castle pays ten modias of wheat (frumentum) and ten modias of general grain (annona) with an increase of four modias; Estune mill (Salop) pays three measures of wheat; Beritune mill (Worcester) pays twenty-two seams of grain; Lochlehvile mill (Salop) pays one seam of malt (brasum); at Dover Hugo pays for his mill rent forty-eight fardingales of wheat (ferlinges de frum̄to*); Ruitone mill (Salop) is entered at a rental of eight sextars of fine grain (siligo).

Ibid., I. 23.

Ibid., I. 255.

Ibid., I. 176b.

Ibid., I. 255b.

Ibid., I. 11.

Ibid., I. 256b.

But whether in wheat or flour, it is evident the

* "Ferdingale," or "fardellus," originally meant a burthen. "Who would fardels bear?" (*Hamlet*). It was equivalent to the summa, or seam, or load, this ordinarily being a horse-load. The term summa, originally meaning a saddle, was subsequently applied first to the pannier or sack carried by a sumpter horse, and next to the contents of the pannier or sack; the seam or horse-load (or fardingale) of wheat being eventually fixed at eight London bushels.

IX. DOMESDAY MILLS.

7. Rentals.

miller's corn rent was a fluctuating one, and in times of dearth and high prices, then of very common occurrence, its value would of course increase very appreciably. At about the commencement of the reign of the Confessor, in such years of dearth as, according to the *Saxon Chronicle*, 1039, 1043, and others, mill rents paid in wheat must have assumed a very serious aspect as compared with their value in ordinary seasons :—

1039. This year the sextar of wheat sold for 55 pence, and even more.

1043. This year there was a great famine all over England, and corn was so dear as was never remembered before, so that a sextar of wheat sold for 60 pence, and even more.

1087. There was a grievous time of scarcity. Almost every other man was affected with the worst of evils, a fever, and many died. And afterwards, from the badness of the weather, there was so great a famine that many hundreds died. O how disastrous and rueful were those times.

1124. There was much unseasonable weather, which injured the corn and all fruits, so that between Christmas and Candlemas one acre's seed of wheat, *i.e.* two seedlips, sold for six shillings, and one of barley for six shillings, and one of oats, being four seedlips, for four shillings.* It was thus because corn was so scarce and the penny was so bad that any man who had a pound at the market could hardly for anything pass twelve of these pennies.

At such periods the miller who had to pay the whole or the greater portion of his rent in wheat evidently had to bear a heavy increase at the very time when, corn being scarce with consumers and very little being ground, his trade would be worse than usual. Such increased rent must, of course, have been met by an increased toll for grinding. As yet manorial lords do not seem to have bound the miller to grind at any fixed rate all the year round, as they did at later periods, and nowhere does the rate of toll appear in Domesday ;† indeed, while a miller was

Cart. Ram.: doc. 219. Domesday Bolden Bk.; III. 572.

* A charter of one of the tenants of the Abbot of Ramsey (Hunts), in 1307, stipulates that the sowing of wheat shall proceed at the rate of one eighth of a quarter per half acre.

† Durham Domesday records the miller of the bishop at Nedderton being bound to grind at the rate of one part out of sixteen of the grain ; but this compilation is dated 1183, a century after Domesday Book, and a time when such stipulations were common.

7. Rentals.

paying a fluctuating corn rent, it would have been unfair to bind him down to an inflexible toll; and it is not till corn rents begin to be discontinued at mills that we find lords stipulating for fixed tolls. Thus was the miller necessarily left to make his own rate of toll, and this unfortunately had to be increased when corn was scarce and his customers less than ordinarily able to pay. To the quandary into which many of the Domesday millers were thus, in periods of dearth, thrown by their landlords, we may attribute the origin of some of that popular hostility which for centuries yet to come pursued the milling craft.

Many mills paid part in cash and part in fish, viz. eels. At Mellinges (Suffolk) five mills were rented at £4, 10s. and two thousand eels; Stradforde mill (Warwickshire) paid 10s. and a thousand eels; Witelavesford mill, in the same county, was charged 10s. and twenty sticks of eels (xx stich anguill). Eels in fact formed so frequently a portion of rent that, during quiet days, a miller might always find profitable employment in spearing or trapping his equivalent for cash under the wheel resting idly in the dam. The fish were ordinarily charged as for delivery upon sticks; an entry in the later chartulary of Christ Church, Canterbury, stipulates for twenty-five eels upon each stick. Thorold Rogers states their value in 1250 to have been 3s. 8d. per stick; but such a high valuation at the time of Domesday will be seen to be out of the question; in fact, in the reign of Edward I., the legal price of eels was fixed at 2d. per stick of twenty-five (that of a turbot 6d., pike 8d., salmon 1s. 3d., &c.), a rate that somewhat consorts with their probable value at the time of Domesday. Payment in eels was quite as ceremonious a matter as payment in cash; the abbot of Ramsey (Huntingdon) about 1345 entered upon the abbey books the fact of one of his tenants being charged one stick of

Ibid. I. 16.

Ibid., I. 238.

Old and New London, II. 44.

Cart. Ramesia: Doc. 438.

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7. Rentals.

eels extra, which newly imposed stick was to be paid at the summer feast of St. Benedict (July 11).

Mill pools and eel fisheries usually were part and parcel of the mill holding; but the streams with trout or salmon fishings supplying the pools, formed a separate property, and at times were rented with the mill:*—At Edmendune (Salop) is a mill with a fishery rendering 10s.: at Estone (Oxford) is a mill with a fishery rendering 30s. As "gurgites" may occasionally be recognised the weirs or dams leased apart from the mill; at Merlie (Hereford) is a mill of 8s. and two gurgites, rendering 2050 eels and five sticks; at Eia (Hereford) is a mill of 3s., and gurgites paying two hundred eels.

Domesday I. 253b. Ibid., I. 160. Ibid., I. 180b. Ibid., I. 134b.

Salt was at times taken in part rent:—Wasmertone (Warwickshire); here is a mill of 20s., four sumas of salt, and a thousand eels.

Ibid.. I. 239.

At Lidum (Shropshire), where were some leagues of woodlands utilised for the feeding of large numbers of pigs:—Here are six radmans, one mill paying one pig and eleven leagues of woods: ibi vi radimans 7 moliñ redd. 1 porc. siluæ 11 leuuedes.

Ibid.. I. 253b.

Various mills paid no rent, being old and worthless:—Sethlindone (Bedford), a ruined mill rendering nothing: fract moliñ qi nichil redd; Dochesuuorde (Cambridge), a mill that used to pay 12s., now ruined, but could be restored: moliñ de xii sot fuit m° confract 7 fz pot restaurari.

Ibid., I. 210b. Ibid., I. 196

Of other mills the omission of rental is explained by their being stated to be new, the builders probably holding them rent free for a time:—Line (Devon): here is a new mill: ibi nonū molinū. But new mills are not always stated to be profitless:—At York two new mills are worth 20s.: ii molendinos nouos ualentes xx solidos.

Ibid., I. 110b. Ibid., I. 298.

* Early medieval Scotch law directs inquiry to be regularly made that "myllars take not the fry or smolts of salmon in the mylne dam or lead, contrair to ordinaunce of the law."

Regiam Majest.: 281, xj.

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Various such entries occur, as Prestetone (Kent) molđ sine censū: a mill without value or not assessed; Linleshille (Salop) molin̄ sed nil redđ—a mill, but it pays nothing.

7. Rentals.

Ibid., I. 5.

Sometimes the miller, in part payment of rent, undertook other duties:—Stoches (Salop), a mill rendering nine sumas of wheat, the miller taking charge of the hives: Suchelie (Hereford), a mill of 6s. and the custody of the hives. At Mortune (Derby) the miller was charged, in addition to payment of 6s. 8d. rent, with the custody of the mill, combining in his office the duties of lessee and keeper: ibi I molin̄ vi solid 7 viii denar cū custode molini.

Ibid., I. 253.

Ibid., I. 260.

Ibid., I. 180b.

Ibid., I. 276.

Of Merchelai (Hereford), it is said, "here is a mill rendering nothing, except a living for him who keeps it:" ibi molin̄ nil redđ nisi tant uictū ejꝰ qui eū custodit; at Rvdeford (Gloucester) is a mill rendering grain according to what it can earn: molendin̄ redđ annonā q̄tū potest lucrari.

Ibid., I. 179b.

Ibid., I. 170b.

8. Winter Mills

8. Some mills, useless in summer, owing to the drying up of the streams, were distinguished as "winter mills." Babenburgam (Suffolk), here is a winter mill: ibi moł hyemał; Huelbec, Condover (Salop): here is a mill of winter, not of summer: ibi molin̄ hiemale n̄ æstvu. Under the alternative term, "molendinus hibernaticus," Du Cange defines the winter mill as a mill for grinding winter grain—in quo molentur fruges hibernaticæ—an apparently erroneous conjecture.

Ibid., II. 304a.

Ibid., I. 255b.

Gloss, 871.

9. Sites.

9. In the case of destroyed mills their sites still retained value, since they represented the right of restoring and working them; and were constantly scheduled. At Merchenestune (Derby) is the site of a mill: sed̄ I molini; at Scrotune (Derby) are one mill and the sites of others: i molin sed alteri molini. A more definite case occurs at Cudessane (Bedford), where no mill is scheduled, but it is recorded

Ibid., I. 276.

Ibid., I. 274b.

Ibid., I. 210.

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that one could be erected there — 1 mol̄ pot̄ ibi fieri.

10. Shares

10. Portions of sites and of mills, *i.e.* proprietary shares in sites and in the right to work mills, are often recorded (a degree of minutiæ not excelled by the exactness with which, for instance, it is recorded that in York one Laudric, carpentarius, held 10½ houses;) Archintone (Lincoln), here are half a church and half the site of a mill; Welletone (Lincoln), the third part of the site of one mill: t̄cia par̄ sedis i mol̄d.

Ibid., I. 298.
Ibid., I. 351b.
Ibid., I. 341b.

Of course partnerships in the mills themselves frequently occur. Tavenham (Norfolk) had a fourth share in a mill and in a church: quartā partē uni mol̄ quartā pars eccl̄a; at Feceham (Surrey) the lord owned the fifth of one mill and the third of another: v^ta pars moline 7 tcia pars alteri molini; Bromselle (Hants) possessed the fourth part of a mill worth 10d.: iiii^ta pars molin de x den; at Huntingdon the king received from the mill 40s., and the earl, holder of the barony, 20s.; the milling receipts happily being free from any such fluctuation as the aggregate income from the manor itself:—"In old time the king received £20 and the earl £10 from the fee farme rent of the burgesses, or more or less as each on his own account could collect." At Telford (Norfolk), of the two mills the king had two parts, and the consul or sheriff a third part; while of a third mill the king had two parts, and of these two parts the earl had one third—De duob3 molendinis h̄'t rex duas partes 7 consul t̄ciam. H't etiā rex de t̄cio mol̄ duas partes 7 de his 11 partib3 comes h̄'t t̄cia.

Ibid., I. 158.
Ibid., I. 31b.
Ibid., I. 45b.
Ibid., I. 203.
Ibid., II. 118b.

While some manors are seen to be so scantily provided as to be compelled to combine to support a mill, and even a church, others are found very liberally supplied with mills; of course the absence or presence of water power having as much influence on the paucity or abundance of the establishments as the

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indifference or the enterprise of the lords of the soil. Among the manors possessing a number of mills may be cited Wimundham (Norfolk), which possessed six, the proprietorship of which was divided in the proportions of 2, 1½, 1, 1, ½. Ibid., II. 136b.

11. Ordinarily manorial mills were retained exclusively for the use of the house of the lord, in which case, of course, they yielded no rental. These mills are entered in somewhat varied phraseology as appertaining to the hall or court, but are not to be understood as necessarily being in the same. Borhunte (Hants) has a mill paying 42d., and another for the hall: moliñ de xlii deñ 7 alt ad aulā. At Bellinghame (Cambridge) are two mills, one yielding 6s., and the other the multure of the manor: ii molini vn redd vi sol 7 alt moliturā de dūio. Radingetune (Somerset), a mill grinding for the hall: ibi moliñ ad aulā molens. Poiwic (Worcester), a mill for the service of the hall: moliñ serviens aulæ. Bertune (Berks), two mills of the court of the abbot, not assessed: ii molini in curia abbis sine censū. Tavestock (Devon), a mill serving the lord's court: ibi moliñ serviens curiæ. Gretford (Cheshire), a mill for grinding grain for the lord's court: moliñ annonā suæ curiæ molentē. At Wenlock (Salop), the Abbey of St. Milburg had held two mills for the use of the monks: Eccłam s milburgæ tenuit ii molini servientes monach. At the royal manor of Lugvordue (Hereford), is a mill worth 7s. per annum, which the sheriff retains for his own use: molin de vii solid qd habet vicecom ad suū opus. 11. Hall Mills. Ibid., I. 44b. Ibid., I. 195b. Ibid., I. 94b. Ibid., I. 174b. Ibid., I. 58b. Ibid., I. 103b. Ibid., I. 268. Ibid., I. 252b. Ibid., I. 179b.

12. Town mills worked by burgesses several times occur:—At Derby in the time of King Edward there were thirteen mills: now there are ten; the town paid King Edward a total rent of £23; now with the mills and the rent of the town of Ludecerce it pays £30: T. R. E. reddeb int tot xxiii lib m° cū molend 12. Town Mills. Ibid., I. 280.

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7 villa Ludecerce reddit xxx lib. The burgesses of Norwic held among them half one mill and the fourth part of another: int eos oms habebant dimp mol 7 quartā partep unip molini. At Lewisham (Kent), the eleven town mills had the custom of the rustic population: xi molini cū gablo rusticoz. At Esledes (Kent) are five mills of the townsmen: v molini villanoz.

12. Town Mills.

Ibid., I. 116b.

Ibid., I. 12b.

Ibid., I. 7b.

13. Working Millers.

13. Though the "pistor" appears in Domesday he is no longer the miller; and the latter is found honoured with a distinctive appellation *molendinarius*, indicative of his devotion to the one avocation of grinding. To the Domesday baker, therefore, was entirely relegated the ancient and now incongruous term pistor, the pounder, though he neither pounded nor ground, but always purchased grain, and took it for grinding to molendinarius the miller. In the Survey we find free burgesses working as bakers at Norwic in the pistrinum or bakery of the earl: while in the town where "St. Edmund, king and martyr, most glorious," had desired to be interred (Bury St. Edmunds), the abbot numbered among his bondservants in the time of the Confessor, pistores and kocos, bakers and cooks.* The avocations of the baker and the miller are for the future therefore seen to be distinct. Under his new name molendinarius, the miller is found included among the bondsmen of the lords permanently attached to the estates; the lord of Fecheham (Suffolk) owns thirty villeins, eleven borderers, an overseer, a beadle, a miller, and a smith: pposit bedel molinari faber: possessing also a mill worth 2s. per annum. The miller is at times found valued together with the mill; Cetelingei (Sussex), a mill, with a miller, worth 4s. per annum: molen cū molinario de iiii sol.; Svinford (Leicester), a mill of 4s., with a servant: ibi ē molin de iiii sol cū

Ibid., II. 118.

Ibid., II. 372.

Ibid., I. 180b.

Ibid., I. 22b.

Ibid., I. 231.

Leg. Ang. Sax. 21.

* The laws of the Confessor include among the servants in baronial households over whom the lord has jurisdiction his "pincernas" or pounders, by whom are meant the pistors, *i.e.* both the millers and bakers as of old.

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13. Working Millers.

i seruo The same servile condition of the millers is to be recognised in the remark appended to the schedule of the ten and a half mills which had rendered St. Martin's, Canterbury, £7: sub illis molinis manent viii hoēs; under these mills are eight men; not, of course, meaning literally that the domiciles of the men were beneath the water mills, but that the millers were subject to the mill owners. This custom was not peculiarly British. In 648 the foundation charter of the French Abbey of St. Bertin's hands over to the abbot among other effects of the estate of Æroaldus, the farinarii, or flourmen. In 980 a similar grant confers the mill with the miller belonging to it: molendinum cum mulinario * sibi super posito. In the reign of Louis VIII., about 1220, we read of molinum unum cum molinario suo: one mill with its miller, scheduled in as matter-of-fact a manner as a mill with its horse. The working miller was in fact mere part and parcel of the equipment of the mill. Like others who "paid tithes and tolls to their lords or the church, and consumed in anxiety the bread they were allowed to retain," the most aspiring hope of the humble grinder of grain was limited by the law of the Conqueror "which his relative King Edward had enforced before him," that slaves should not be sold out of their own country, but should live and die on the manor in which they were born.

Ibid., I. 2.

Fr. Doc. Inedit: Cart. Sithieuse.

Cart. Saviniacense, Doc. 207.

Placitum Ludovico: Du Cange.

Early Norm. Hist. Lappenberg, 92.

Leges Ang. Sax. Spelman, 229.

"Molendinarius" during the next three or four centuries was etymologically subjected to as many changes as the "mola" itself; the term appearing in the various records of these periods variously as molendinator, molnerius, molnaironus, &c.; while we also meet in one charter with a Martha, molendinaria, probably a widow, carrying on the business of a miller, as in later times frequently occurred. An early continental customs roll draws a distinction be-

Stat. Massil.: I. 55.

* Mulinario dictur alio vocabulo "Molendinarius.—*Ibid: Gloss Peculiare.*

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tween molnerius as the principal miller, and molnaironius as his subordinates; and mentions two officers or overlookers, and the mulateers who drove the mill beasts: these last officials occurring also in the early history of Dublin Castle mills.

Text: Vol. IV.

14. Owners.

14. In contrast to the lowly journeymen millers were the Saxon owners of mills, men of position, possessing frequently estates of their own. It was not alone noblemen of ancient birth and hereditary dignity who were accounted thanes and capable of holding land and mills; freemen of any rank who made their way in the world were esteemed as noble as any of them. The laws of the city of London in the time of Athelstane (925–941), for example, enact:—"If a churl or husbandman thrive so that he has fully five hides of his own land with a church, a kitchen (kycenan), [this doubtless containing, like the Roman pistrinum, the bakery and the mill], a bellhouse, a gatehouse, and a general seat and office in the hall of the king, thenceforth is he worthy of the rights of a thane" —exactly as one of the Brehon laws of Ireland declares the owner of a kiln or a mill entitled to take rank as a freeman. Many such men do we now find holding mills. Still, that holders of Domesday estates or mills were not always thanes or nobles is evident, since in that case there would have been no necessity to state owners as being free or not free as the case might be. Among the holders of portions of the manor of Stibenhede (Stepney), of which the Bishop of London was manorial lord, were the four Saxon holders of mills already mentioned, one or two if not all of whom were unable to give or sell their land without the license of the bishop: ñ potuit dare vel vendere p̃ter ej^{9} licentiã. Sudtune manor (Worcester) with its mill was held by Ælfi, who could not leave the manor to live elsewhere: ñ poterat recedere ã dño suo. Some, on the other hand, were free to come

Leges. Ang. Sax.: 70.

Text: II. viii.

Domesday, I.

IX DOMESDAY MILLS.

14. Owners.

and go as they chose; the Saxon, Goderic, who held Stotone (Worcester) under Roger de Lacy, could go away as he pleased: potuit ire quo voluit. The curious expression also is used that such freemen might go with their lands as they pleased: poterant ire cū t̄ra quo voleb. Ibid., I. 176b. Ibid., I. 180.

Many instances occur of freemen holding mills. At Cetitone (Warwick), is half a mill worth 5s., and also half a mill worth 5s.; the first half appertains to the estate formerly held by Celred and Godric, and now by Llewellyn (mentioned elsewhere as a freeman holding Socheberge, in the same county); the other half of the mill appertaining to Godric, who held half the manor in the time of King Edward, and holds it still. At Wistanestov (Salop), the mill was held by an enfranchised man, uñ francig̃ hñs, who paid five sumas of wheat. In Stanford (Lincoln), there used to be twelve lagemen (lords of small estates with limited manorial jurisdiction), and one of these had "under him" seventeen houses and half a mill of 15s.: unus eoz h't xvii mañs sub se 7 dimid' moliñ. At Breme (Wilts), Edward holds four hides and Theodore four hides, while there is one mill paying 16s., held between them: moliñ int̃ eos. At Minstre (Oxford), Sauuold, who holds the manor of the king as he did in the time of Edward, holds of the king two mills worth 40s. adjoining the Holy Wall, which the king granted to him with his wife: idē teñ de rege ii molinos q^os rex ei c̃cessit cū uxore sua juxta murū st̄ 7 val xl solid'. Ibid., I. 240. Ibid., I. 260b. Ibid., I. 336b. Ibid., I. 67. Ibid., I. 160b.

Among the free Saxon proprietors were the holders under what was known as the allodial system, possessing their lands as absolutely as any freeholder of the present day, and not subject to their confiscation at the will of the king. It was this latter contingency which William engrafted on to the crude feudal system of the Saxons; nominally every man's

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land being taken from him by the Conqueror and restored again as an act of grace by the king, whose good-will he was bound to retain under pain of suffering confiscation. Such was the position of many Saxons owning lands and mills at the time of Domesday. Ælmar held Cetelinge (Sussex), with its mill and miller worth 4s. per annum from King Edward by allodium: sic alodiū.

Ibid., I. 22b.

One at least of the landowners of the time entertained very decided opinions as to the desirability of providing abundant milling resources. In Cambridgeshire a very considerable landed proprietor was Picot, who built three mills in the town of Cambridge, and in doing so had not only laid waste pastures and destroyed several houses, but also one mill belonging to the Abbot of Ely and another belonging to Earl Alan; his three mills eventually rendering £9 per annum: Burgum de grentbrige, ipse Picot fecit ibi iii molend' q' aufer' pasturā 7 plures domos destruunt 7 mol unum abbis de Ely 7 alterū Alani comitis, ipsa molend' redd't ix lib p annū. This high-handed proceeding on the part of Picot still needs explanation; the city had proved its right as a Hundred, was divided into wards, and was practically self-governed, yet Picot's conduct seems to have been condoned. Perhaps he made atonement by giving up one of his mills to the town; as the Ely Domesday, compiled a century later, records with perfect complacency the fact that Picot, the sheriff, has in the town of Cambridge two mills yielding £8 per annum. In contrast to Picot's anxiety to own mills (various of his establishments being scattered through the county) is the indifference of Hugo de St. Quintins, who claims to hold the lordship of Langlie (Hants) under the Bishop of Bayeux, to whom he says he gave for it a mill that he had from a man: ut dicit p exc̃abio uni molini q̄d habeb de uno hoē.

Ibid., I. 189.

Inq. Eliensis: Domesday, iv.

Domesday, I. 302.

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15. Disputes.

15. The ownership of mills was jealously criticised, and often contested. The king often challenged the titles of holders on the ground of their having been illegally erected, or escheated. Povintone (Dorset), here is a mill rendering 25s.; the mill of the manor being challenged on behalf of the king: huj^{o} m molin calūniat ē ad op^{o} regis. Local evidence in disputed cases was not always accepted. At Cambas (Suffolk), Hugo de Montford held half a mill which he reclaimed from one of the freemen of the manor who held in the time of Earl Brian by ancient fealty: but the testimony of the Hundred is not germane to the matter; teste ħ nusq̄ pertinuit. But as a rule such evidence was recorded, if not relied upon; at Annei (Berks), is a mill of 12s. 6d., and another of 7s. 6d., but this latter belongs to the manor of Cerletone, "so says the Hundred:" sic dicit Hund. This statement, however, may be compared with another respecting Cerletone itself, where is a mill of 7s. 6d., which Walter Giffard holds unjustly "as the Hundred says:" clearly, therefore, which of the manors the mill belonged to, and who owned it, being disputed questions with the jury. At Ardintone (Berks), are a Saxon mill held by Edwin at a rent of 11s., and two others held by Savuin, paying him 25s.; Cola, an Englishman, challenged the title to one of these mills, but Aluuin, Godwin, and Aluric, testify to their always belonging to the manor of Ardintone: Cola anglic^{o} calūniat un ex his molinis sed Aluuin 7 Godwin 7 Aluric testificant^{o} q^{d} sēp jacuit in Ardintone; and the Englishman's claim that the disputed one was an illegal novelty of course would fall to the ground. A similar dispute was brewing at Ferneham (Bucks), where Randolph Taillebois was building upon the land of Bertran a mill which was not there in the time of King Edward, as the Hundred says: Radulf tailgebose fecit sup ^{o}trā Bertrani unū molin qui non fuit ibi

Ibid., I. 80^{b}.

Ibid., II. 291.

Ibid., I. 60.

Ibid., I. 62.

Ibid., I. 157^{b}.

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T.R.E. ut hundᵈ testatur: that is to say, he had built it on a site where no mill had been in the time of Edward, and where he (Randolph) had no right to erect one; and as it stood upon the land of Bertran lord of the manor, it undoubtedly would eventually revert to him. At Crosby (Lincolnshire), it was decided that William Blundell ought to have a garden in the land of Ivo Tailbois, but was hindered because of a mill which was not there in the time of King Edward: in Crosbi debet haƀe Wilłs blundꝰ unū hortū in trã Iuonis tallebosc sed impeditꝰ ppꝰ molendinū qd̄ non fuit ibī T.R.E.

15. Disputes.

Ibid., I. 376.

Mills were often "invaded" by alleged wrongful owners. At Clachesbi (Lincoln), Gozelin, the son of Lambert, lost a mill on the land of Tailbois, which though a jury declared should be his, had been invaded and taken from him by Goisfred, one of Ivo Tailbois' men: debet haƀe Gozelinꝰ fili Lamƀti i molin̄ qd̄ Goisfred hō Iuonis taillebose inuasit supꝰ eū. The jury also deprived Gozelin of another mill at Tademulle which he held in succession to his father Lambert, but which they said Robert Despenser, owner of the land, should have.

Ibid., I. 376.

16. Embryo of Soke.

16. The whole of the considerations regarding proprietorship seem to suggest that in Saxon times manorial lords rarely made any particular objection to any of their tenants, who might choose to build mills, doing so and working them either for their own private use or for grinding for their neighbours; and that therefore very little, if anything, was apparently yet in existence of the system well known shortly afterwards as manorial soke of mills; though it seems clear that if a lord himself built a mill he could if he chose compel his tenants to grind at it. Still in Domesday the services of tenants to their lords are often fully stated, but nowhere are the people said to be bound to grind at the lord's mills.

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In Lene (Hereford), are stated the number of villeins, borderers, radmen, admitted men, &c.; the villeins paying to the lord the custom of 13s. 4d., the admitted residents paying three sextars of wheat, &c.; at the same time there are here two mills paying to the lord 26s. 4d., and it is added that from the customs, the mills, the villeins, and the associated men—de c̄suetudin⁹ 7 de molinis 7 uillis 7 colib̄tis,—was received 105s., besides certain income in eels; yet no stipulation is included compelling tenants to grind at the mills. At Leominster, a royal manor, very full details are given of the number of residents and their payments to the coffer of the lord the king, both in the time of Edward and of William; but nothing is said of tenants being astricted to the mills, though there were eight of them in the town paying in the time of Edward 73s. and thirty sticks of eels, and in the time of William, 108s. and a hundred sticks of eels; apparently being maintained therefore on what custom the millers could by their own exertions secure. And other instances might be cited.

16. Embryo of Soke.

Ibid., I. 179b.

Ibid., I. 180.

Despite the lack of evidence in Domesday as well as in Saxon charters, however, we find a jury long after the date of the Survey stating that certain tenants had been compelled to grind at their manor mill a century and a half before the time of the Conqueror. At a court baron held at Sutton Coldfield, Warwickshire, 3 Ed. II. 1309, with reference to the customs of that manor, it was stated, doubtless quite correctly, that the tenants were then bound to grind at the baronial mill, as, in 1309, most tenants were. But, it is added: Et dicunt quod omnes prædicti consuetudines solebant fieri et a tempore regis Athelstane et tempore regis Iohannis et ante coronationem Henrici regis: They say that all the aforesaid customs were in operation in the time of King Athelstane and King John, and before the coronation of King Henry (III.). This

Dugdale's Warwick: Thomas, 1730 912.

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16. Embryo of Soke.

reference by the jury to the reign of Athelstane is probably erroneous, and at all events not sufficiently valid to prove on its isolated authority that the custom existed in Saxon times. Still there was no law in 940 to prevent the Saxon manorial landowner who might build a mill compelling his tenants to grind their corn there; and possibly the custom was even then coming gradually into operation in isolated cases, on the pure initiative of lords who desired to make their mills at least pay their way. Such a case was that of the mill of Cert, Dover, which in 762 owned half the grinding of the town of Hythe. Later millowners of course prevented the building of other mills on their lands.

Text: II. 97.

Domesday, I. 239b.

At Coventry was scheduled one mill valued at 3s. per annum, upon the estate of Comitissa Godeva: who, if milling soke had existed among those various manorial imposts from which she so gallantly freed the burgesses, would no doubt either have presented the mill to the town, or have included in her contract with Earl Leofric a clause in favour of free milling.

17. Royal Keepers.

Ibid., I. 51b.

Text: Vol. III.

17. A mill in the custody of a certain keeper on behalf of the lord the king, at Einforde (Hants)—uñ moliñ quē ten' q'dā custos dom' regis—affords the earliest allusion to custodians of king's mills. Aluric held this and other adjacent manors of the king, but the mill was excepted from his lordship and retained by the king, who placed it in charge of an official to work it on his behalf, either permanently or till it should be granted to some one else.

18. De Jure Regalia.

18. The ownership of corn mills has commonly been reputed in even late medieval times to be a special prerogative of the crown; popular sentiment and tradition attributing to the sovereign the sole right of erecting mills in any part of the kingdom. This

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18. De Jure Regalia.

was not the case at the date of Domesday, nor has it been since. In a primitive state of society a conqueror who was *ipso facto* king literally possessed every privilege and prerogative, and was actually the proprietor of the entire kingdom and all it contained; and in such a condition of affairs the right to provide mills and derive an income therefrom might, no doubt, be reasonably concluded to be his. But these first principles could not, and did not, endure for long. Lands were liberally bestowed by kings upon retainers, noble and otherwise, for services rendered, as well as for aid still to be demanded; and with such lands went their rights of local government and income, including, among other matters, the right to build and work mills. As soon as any such alienation took place, milling rights remained a royal prerogative no longer, and the only right in mills the crown thenceforth possessed applied solely to estates retained as crown property. Thus when William I., at the moment of his conquest, stood titular possessor of the entire kingdom and all its possible sources of revenue, he possessed its entire milling rights; but so soon as the land was partitioned out into baronies, and these again into manors, every one of the grantees of these latter received, so far as his own land was concerned, those powers of government and exclusive milling and other privileges which had previously appertained to the crown. And to their original footing milling rights never reverted; they never again were prerogatives of the sovereign. Among the mills of Domesday those remaining in the hands of the king are scheduled precisely as are those of any baron or private landowner; they stood only upon his own private estates; they were not mills of the largest capacity or the highest class; and the sovereign as millowner, like his mills as trading establishments, possessed neither rights nor privileges which were

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not shared by the most insignificant lord and the smallest manorial mill in the realm.*

19. Tithe Free.

19. Sir Henry Ellis, in his dissertation upon Domesday (I. 353), states that mills existing at the time of Domesday were free from tithe:—"Cases in which the evidence of Domesday is yet appealed to in our courts of law are in proving the antiquity of mills, and in setting up prescriptions *in non decimando*: by the statute of Edward II. it was determined that prohibition should not lie upon demand of tithe for a *new* mill: a mill mentioned in Domesday must be older than the 9th of Edward II., and is thus discharged by this evidence from tithe." We see it

Text: II. 99.

claimed in the reign of the Confessor, that even from the time of St. Augustine mills were declared subject to tithe, but apparently this edict became a dead

Text, Vol. IV.

letter, and mills remained free. Dee mills, Chester, founded in 1093, were declared by their owner, Earl Robert, to be by him made subject to payment of tithes to the Abbey of St. Werburgh: a fact which appears to substantiate the presumption that without such voluntary act the mills were free. At all events, all mills in existence before the passing of the Act of 9 Edward II., 1316, were by that Act admitted to be free; among them, of course, being the mills of Domesday. The object of the statute was to confine the ex-

Articuli Cleri: St. 1, c. 5.

emption to such ancient mills as had enjoyed it:—"If any do erect on his own land a new mill, and afterwards the parson of the same place demandeth tythe for the same, if the king's prohibition is then produced in this form, 'Quia de tali molendino hactenus decimæ non fuerunt solutæ, prohibemus, &c., et sententiam excommunicationis si quam hac occasione promulgaveritis,

Cod. Dipl. Palatinus: ap. Beckman.

* A diploma of Frederick I. of Germany, dated 1159, includes the ownership of public mills among the rights of the crown, which are specified, in order to set doubts at rest, as comprising money, public roads, aqueducts, rivers, public mills, and bakeries, &c. Quia vero superius mentionem de regalibus fecimus ne quis de eis dubitet, nominatim ea exprimus: hæc itaque regalia esse dicuntur, moneta, viæ publicæ, aquatilia, flumina, publica molendina, furni, &c.

revocatis omnino,' the answer to the claim for exemption shall be that the prohibition was never granted in such cases, and the king hath decreed that it shall hereafter not apply in such cases." The operation of this ancient Act has been upheld by decisions in the law courts in modern times.

Hughes v. *Billinghurst* (Court of Exchequer, 10th December 1722). The vicar of Suming, in Berkshire, claimed tithes from the water corn mills there, the defendant pleading that the mills being ancient mills, and never having paid tithes, were free: the Bill being dismissed as to the mills, with costs.—Domesday schedules at Sominges, two mills yielding 12s. 6d. per annum. Wood's Decrees, II. 227.

Weatherhead v. *Bradshaw* (Court of Exchequer, 27th January 1773). The plaintiff, rector of Halton, near Lancaster, in this case claimed tithe in respect of the mill there. The Bill charged that the defendant was owner of a corn mill which had been erected within twenty-five years past; that he or his servants ground there, one day with another, twenty loads of grain per day, and had gained the clear sum of 8d. for each load so ground; that tithe thereupon was due to the plaintiff, who was entitled to a tenth part of the clear profits after payment of all necessary charges. The Bill further charged that the mill was not erected upon the site of any ancient mill, and was not therefore exempt from tithe. Defendant admitted that he owned the corn mill, but insisted that it was an ancient manor mill within the demesne lands, and had been standing prior to the reign of Edward II.; it had, however, been washed down, and had been rebuilt by him about eighteen years later; further, the expenses of working it, taking one year with another, amounted to more than the multure it earned. He denied that the mill was erected upon what had been waste ground, or upon any other ground than the site of the old Ibid., III. 426.

IX. DOMESDAY MILLS

manor mill, though a dwelling-house he had built for his servants was erected on such waste land adjoining the site of the old mill. The Court ordered the Bill as to the tithe of the mill to be dismissed.—We find Domesday affording no evidence of a mill at Halton, and the case rested solely, therefore, upon the establishment of the mill prior to 1316.

19. Tithe Free.

20. Quarries.

20. Millstone quarries, let at rentals, are occasionally mentioned. At Watone (Notts), is a molaria where millstones are dug, molaria ubi molæ fodiunt, yielding four silver marks per annum; at Bigenevre (Sussex), is a molaria paying 4s. a year.

Domesday: I., 290b. Ibid., I 25.

21. Dover Mill.

21. Dover mill was a source of danger to mariners. —In introitu portus de Douere est unū molendiñ q^d oms pene naues confringit p magnā turbationē maris 7 maximū dānū facit regi 7 hominibz 7 non fuit ibi T.R.E.; de hoc dicit nepos Herberti q^d ep^Ds baiocensis concessit illū fieri Auunculo suo Herberto filio Iuonis: At the entrance to the port of Dover is a mill which causes disaster to vessels by the great disturbance of the sea, and so causes the greatest damage to the king and his men; it was not here in the time of King Edward; the nephew of Herbert says that the Bishop of Bayeux [half-brother to William I.] granted leave to build this mill to his uncle the said Herbert, son of Ivo. Sir Henry Ellis suggests that this may have been a tide mill, driven by water running on the ebb from a dam which had been filled on the flood; still there is no direct evidence in Domesday that such mills were then known, and the earliest of which, we are aware, does not occur till considerably later.

Ibid., I. 1.

Text: II. xi.

22. Trumpington Mill.

22. Trumpington (Cambridge) had its mill value 20s.: one of its later lords, William de Trumpington, being a baron who signed Magna Charta; and one of its millers the subject of one of Chaucer's *Canterbury Tales*:—

IX. DOMESDAY MILLS.

At Trompington not far from Cantebrig
There go'th a brook and over that a brig,
Upon the whichë brook there stood a melle.*

23. Schedule.

23. *Mills are mentioned in the Survey at the places named in the appended list. At each place the number of mills is stated with the rentals so far as they are given: in Essex, Suffolk, and Norfolk, rents are not scheduled (though two or three exceptional cases occur); the rental of the mill in such cases being included in the general total income resulting from the estate or manor. At places possessing several mills, the rent stated is that of all the mills mentioned; and at places possessing only portions of mills the rent quoted is that of the portions, not of the entire mill. Mills from some cause returned as* sine censū, *that is, not valued, or of no valuation, are so marked in our list. The present value of the money rents*

* The tale does not redound to the credit of the grinding craft, but it will be remembered it was told by the Reeve in retaliation of a vindictive story which had been previously told by a miller :—

A miller was there dwelling many a day
As any peacock he was proud and gay . . .
A jolly popper bare he in his pouch,
There n'as no man for peril durst him touch . . .
He was a market beter at the full . . .
A thief he was forsooth of corn and meal,
And that a sly and usant for to steal. . . .
Great soken hath this miller out of doubt
With wheat and malt of all the land about:
And namëly there was a great collége
Men clepe the Soler Hall at Cantebrege;
There [at Trumpington] was their wheat and eke their malt yground.
And on a day it happed in a stound
Sick lay the manciple [steward] on a malady
Men wenden wisly that he shouldë die.
For which this miller stole both meal and corn
An hundred times morë than beforn.
For therebeforn he stole but courteously,
But now he was a thief outrageously.
For which the warden chiddë and made fare
But thereof set the miller not a tare:
He craked boast, and swore it n'as not so.

Two "younge poore scholars" undertake to circumvent the valorous man of meal :—

Upon the warden busily they cry
To give them leavë but a little stound
To go to mill and see their corn yground:
And hardily they dursten lay their neck
The miller should not steal them half a peck
Of corn by sleightë, ne by force them reave.
And at last the warden gave them leave.

Arriving at the mill with a sack of wheat on the back of a horse, they cordially greet the unsuspecting miller, inquiring after the health of his wife and daughter;

IX. DOMESDAY MILLS.

23. Schedule.

will be about one hundred and ten times the amount stated.

The Commissioners sometimes quote, with regard to the mills, similar comparative figures to those they usually apply to manors: giving their number and rent severally in the time of King Edward, at an intermediate period, and at the time of the Survey.

At places occurring more than once in the list, there were more landowners or manorial lords than one; and each of them owned mills.

The lists will be found to contain the names of numerous places, as that of Pangebourne, Berkshire, where

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and remarking that they have some corn which the miller will oblige them by grinding with what speed he may :—

"It shall be done (quod Simkin) by my fay.
What will ye do while it is in hand?"
"By Gad, right by the hopper will I stand
(Quod John) and see how the corn goes in:
Yet saw I never, by my father's kin,
How that the hopper waggës to and fro."
"Alein," answered John, "and wilt thou so?
Then I will be beneathë, by my crown,
And see how the mealë falls adown
Into the trough: that shall be my disport:
For John in faith I may be of your sort:
I is as ill a miller as is ye."
The miller smiled at their nicety,
And thought, all this n'is done but for a wile.
They weenen that no man may them beguile,
But by my thrift yet shall I blear their eye
For all the sleight in their philosophy.
The morë quaintë knackës that they make,
The morë will I steal when that I take.
Instead of flour yet will I give them bren,
The greatest clerks are not the wisest men.

Thereupon quietly setting free the students' horse which was tethered behind the mill, he proceeds with the grinding: the two youths watching the process as arranged. Ere long they emerge with their sack of meal, and finding their beast of burden gone, hastily leave the sack with the miller, and pursue the horse :—

And when the miller saw that they were gone,
He half a bushel of their flour hath take,
And bade his wife go knead it in a cake.
He said, "I trow the clerkes were afeard,
Yet can a miller make a clerkë's beard
For all his art."

Late at even the students return, crestfallen and weary, and conscious that—

Our corn is stoln, men will us foyyës call,
Both the wardén and eke our fellows all:

beg the miller to accommodate them for the night; but, upon his making amends for the stolen meal by hospitably entertaining them, serving him a very scurvy trick :—

Thus is the proudë miller well ybeat
And hath ylost the grinding of the wheat.

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ancient watermills still exist; and where undoubtedly, therefore, milling has been continuously conducted from Saxon times.

IX. DOMESDAY MILLS.

23. Schedule.

CHENTH. (Domesday, I. 1.)

Dovere, 1 : at entrance to port. See Text, p. 128.
Bevgsberg Hd., 1 : 40s.
Cantvaria, 3 : 108s.
St. Martin's, 10½ : £7 T.R.E., £12 now. Subject to these mills are 10 men.
Do. 1 : Herbert, the son of John, gave the Bishop of Bayeux 1 gold mark for one of his mills.
Svdtone, 1.
Elesford, 1.
Middeltone, 6 : 30s.
Sabreshant, 1 : 20s.
Cantvaria, 1 : 5s., formerly belonging to the Archbishop.
Tarent, 2 : 50s.
Otefort, 6 : 72s.
Do. 2 : 24s.
Sondresse, 3½ : 13s. 6d.
Do. 1 : 6d.
Bix, 3 : 48s.
Erhedre, 3 : 50s. 6d.
Metlinge, 2 : 10s.
Norflvet, 1 : 10s., with a fishery.
Broteham, 3 : 15s.
Meddestane, 5 : 36s. 8d.
Do. 1 : 5s.
Gelingeham, 1 : 16s. 8d.
Rocvlf, 1 : 25d.
Estvrsete, 12 : £4, 5s.
Do. 3.
Bvrnes, 2 : 8s. 6d.
Cheringes, 1 : 40d.
Wingheham, 2 : 34s.
Merseham, 2 : 5s.
Aldringtone, 3 : 16s.
Estursete, 5 : 20s.
Romenel, 1 : 25d.
Leminges, 1 : 30d.
Hede, 2 : 7s 6d.
Elesford, 2 : 43s.
Do. 1 : 5s.
Breistede, 2 : 24s.
Olecobe, 1 : 4s.
Lerham, 1 : 7s.
Salteode, 9 : 20s.
Orpinton, 3 : 16s. 4d.
Pecheham, 1.
Hoilingeborde, 2.
Ferlagam, 3 : 27s. 8d.
Do. 1 : 20d.
Monocstune, 1 : 10s.
Gegham, 4 : 100s.
Nordevde, 8 : 71s.
Prestetone, 1 : sine censū.
Certeham, 5½ : 70s.
Gomersham, 1 : 25s.
Certh, 2 : 6s.
Litelcert, 2 : 5s. 10d.
Welle, 1 : 30d.
Estreia, 1½ : 30s.
Apeltres, 1 : 2s.
Estanes, 1 : 6s. 8d.
Fachesham, 2 : 15s.
Bronlei, 1 : 4s.
Mellingetes, 1 : 2s.
Esnoiland, 3 : 40s.
Coglestane, 1 : 30d.
Frandesberie, 1 : 12s.
Borchetelle, 2 : 20s.
Hagelei, 1 : 20s.
Lolingeston, 1 : 15s., 150 eels.
Ferningeham, ½ : 5s.
Do. 1 : 10s.
Tarent, 2 : 18s.
Do. 1 : 20s.
Hortvne, 1 : 5s.
Do. 1 : 15s.
Do. ½ : 5s.
Hov, 1 : 10s.
Rochelei, 1 : 12s.
Ciresfel, 1 : 10s.
Wicheham, 1 : 20d.
Craie, 1 : 42d.
Grenviz, 4 : 70s.
Crai, 1 : 10s.
Codeham, 2 : 14s. 2d.
Bacheham, 1.

IX. DOMESDAY MILLS.

23. Schedule.

Chenth—*contd.*

Lelebvrne, 1 : 7s.
Elentvn, 1½.
Dictvne, 1 : 10s.
Sifletone, 1 : 10s.
Riesce, 1 : 10s.
Ofeham, 1 : 50d.
Eddintone, 2 : 11s. 2d.
Meletvne, 1.
Ofeham, 1 : 10s.
Berlinge, 1 : 10s., 330 eels.
Borham, 1 : 6s.
Haslow, 2 : 11s.
Hariardesham, 2 : 11s. 6d.
Ferebvryne, 2 : 40d.
Esledes, 5 : mills of the townsmen.
Avdintone, 1 : 4s.
Stochingeberge, 1 : 64d.
Alnoitone, 2½ : 17s.
Svdtone, 1.
Bogelei, 1 : 5s.
Westselve, 1 : 15d.
Oteham, 1 : 5s.
Brvnfelle, 1 : 6s. 8d.
Tvrnha, 1 : 6s.
Gelingeham, 1 : 16s. 7d.
Ceteham, 1 : 32d.
Hov, 1 : 10s.
Ferlagam, 1 : 5s.
Nedestede, 2 : 14s.
Otringeberge, 2 : 3s.
Do. 1 : 16d.
Testan, 1 : 3s.
Boselev, 3 : 36s. 8d.
Litelbroteham, 2 : 4s.
Celca, 1 : 5s.
Heham, 1 : 10s.
Bichelei, 1 : 5s.
Cerce, 1 : 6s. 8d.
Tangas, 1 : 8s.
Borne, 4 : 16s. 8d.
Bvrnes, 1 : 38d.
Wicheham, 2 : 50s.
Fvlchestan, 7 : £9, 12s.
Do. 1½ : 16s. 5d.
Do. 2 : 24s.
Do. 1 : 30d.

Chenth—*contd.*

Alham, 2 : 6s.
Berham, 1 : 20s. 6d.
Do. 2 : 50s.
Ore, 1 : 22s.
Nortvne, 3 : sine censū.
Cilleham, 6½ : £6, 8s.
Ospringes, 1 : 11s. 8d.
Eslinges, 1 : 10s.
Do. 1 : 10s.
Hortone, 2 ; 1 silver mark.
Berchevelle, 1 : 40d.
Piventone, 1 : 60d.
Ringetone, 1 : 40s.
Ewelle, 2 : 46s.
Wesclive, 2 : 28s.
Dovere, 1 : 48 ferlingels of wheat. It does not belong to any manor.
Ewelle, 5½ : £6.
Wi, 4 : 23s. 8d.
Lertham, 2 : 6s. 8d.
Borne, 2 : 9s. 6d.
Estvrai, 10 ; £8.
Tanet, 1.
Rapentone, ¼ : 15d.
Mundingeham, 1 : 16s.
Levisham, 11 : £8, 12s., with the grinding of the rustics.
Sievetone, 1 : 10d.
Essetesford, 2 : 10s. 2d.
Etretone, 1 : 20s.
Postinges, 2 : 6s.
Do. 1 : 25d.
Sedlinges, 1 : 30d.
Hortone, 1 : 25d.
Do. 1 : 30d.
Estratites, 1 : 26d.
Etvselle, 4½ : £4, 17s. 4d.
Neventone, 3½ : 105s.
Do. 1 : 24s.
Brebvrne, 2 : 7s.
Oistreham, 1 : 5s.
Boltvne, 2 : 7s. 2d.
Hallinges, 2 : 25s.
Bermehnge, 1 : 5s.
Wivarley, 1 : 9s., 60 eels.
Marovrde, 2 : 10s.

23. Schedule.

SVDSEXE. (I. 16.)

Boseham, 8: £4, 30½d.
Mellinges, 5: £4, 10s., 2000 eels.
Do. 2: 10s.
Do. 1: 5s.
Odintvne, 1: 39d.
Pageham, 1: 10s.
Loventone, 1: 6s.
Hafelse, 1: with a fishery fractured and destroyed.
Mestringes, 1: 30d.
Prestetone, 1.
Staninges, 4: 47s.
Boseham, 3: 14s.
Halestede, 1: 4s.
Holintvn, 2: sine censū.
Hov, 1: 7s.
Cedesfelle, 1: serving the Hall.
Heuhert Hd., 1: 2s.
Berewice, 1: 10s.
Borne, 1: 5s.
Beddingham, 1: 8s.
Ferle, 2: 30s.
Lovringetone, 1: 8s.
Radetone, 1: 4s.
Sesingeham, 1: 10s., 500 eels.
Hertevel, 1: 4s., 350 eels.
Gorde, 1: 9s.
Hortsede, 1: 8s.
Lodintone, 1: 20s.
Cetelingei, 1: 4s., with a miller.
Hame, 1: 2s.
Circestre, 1: 5s.
Sifelle, 1: 40d., 500 eels.
Reredfelle Hd., 1: 30d.
Meseevelle, 1.
Castrṽ Harvndel, 1: 40s.
Do. 1: 10 modias of wheat and 10 of coarser grain: and 4 modias in addition.
Silletone, 2: 12s. 7d.
Do. 1: 40d.
Loventone, 1: 7s.
Hertinges. 9: £4, 18d.
Traitone, 1: 12s. 6d.
Treverde, 1: 30d.
Teteherste, 1: 8s., 100 ells.
Stedeham, 3: 30s.
Cochinges, 5: 38s. 6d.
Seleham, 1: 10s., 100 eels.
Tadeham, ⅓: 14d.
Peteorde, 1: 20s., 180 eels.
Tolintone, 1: 20s., 120 eels.
Greteham, 1: 10s.
Donechitone, 4: 38s.
Svdtone, 3: 13s. 9d.
Berleventone, 2.
Hvnd, 1.
Botechitone, 1: 11s.
Borne, 3: 40s.
Do. 1: 10s.
Do. 1: 10s.
Harditone, 1: 30d.
Fiseborne, 2: 40s.
Mvndreham, 1½: 6s. 8d.
Hvnd, 1: 5s
Hvnestan, 1: 20s.
Brideham, 1: 20s.
Estorchetone, 2: 11s.
Perham, 1: 30d.
Nordborne, 2: 25s.
Poleberge, 2: 11s.
Lolinminstre, 1: 5s.
Nonneminstre, 1: 30d.
Wepeham, 1: 30d.
Bigenevre, 2: 28s., and one millstone quarry of 4s.
Berneham, 1: £4 in the time of King Edward, afterwards, and now.
Offham, 2.
Hentone, 1: 5s.
Hvnd, 1: 3s.
Mersitone, 3: 7s.
Rochintone, 2: 12s. 6d.
Niworde, 2: 23s.
Dicelinges, 1: 30d.
Birchinges, ½: 40d.
Do. ½: 13s. 4d.
Poninges, 2: 12s.
Nivembre, 1: 2cd.
Herst, 3: 9s.
Chemere, 2: 12s.
Plvntvne, 2: 20s.
Childeltvne, ½: 15d.
Bercham, 3½: 20s.

IX. DOMESDAY MILLS.

23. Schedule.

Svdsexe—*contd.*

Trailgi, 2 : 65d.
Staninges, 1 : sine censū.
Semlinvn, 1 : 6s.
Aplesham, 1 : 6s.
Wantelei, 1 : 20d.
Bradwatre, 1 : 7s.
Svltinges, 1 : 3s.

Svdsexe—*contd.*

Lancinges, 1 : 7s.
Taceham, 1 : 3s.
Moham, 1 : 15d.
Do. 1 : 3s.
Bongetvne, 1 : 2s.
Welbedinge, 1 : 10s.
Epinges, 1 : 3s. 4d.

SVDRIE. (I. 30.)

Wochinges, 1 : 11s.
Meretone, 2 : 60s.
Waletone, 2 : 30s.
Cherchefelle, 2 : 12s. 2¼d.
Chingestvne, 5 : 20s.
Etwelle, 2 : 10s.
Feceham, 4 : 4s.
Gomeselle, 1 : 40d.
Siram, 2 : 10s.
Dorchinges, 3 : 15s. 4d.
Do 1 : for the Hall.
Godelminge, 3 : 41s. 8d.
Croindene, 1 : 5s.
Mortelage, 2 : 100s.
Merstan, 1 : 30d.
Ferneham, 6 : 46s. 4d.
Wochinges 1 : 30d.
Brvwlei, 5 : 26s.
Celeorde, 1 : 7s.
Do. 1 : 20d.
Benetstede, 1 : 20s.
Pachesham, 2½ : 12s.
Do. ½ : 6s.
Codintone, 1 : 40d.
Feceham, fifth part of one mill and third part of another: from the mills, 6s. 6d.
Ditone, part of a mill: 15d.
Patricest, 7 : £42, 9s. 8d., or wheat of the same value: the property of St. Peter's Church, Westminster [the Abbey].
Mordone, 1 : 40s.
Peliforde, 2 : 10s.
Covenham, 3 : 13s. 4d.
Bocheham, 1 : 10s.
Do. 1 : for the Hall.
Biflet, 1 : 5s.
Limensfeld, 1 : 2s.
Acstede, 2 : 12s. 6d.
Wachelestede, 1 : 6s.
Notfelle, 1 : 2s.
Borham, 1 : 15s.
Werpedesdvne, 1 : 30d.
Civentone, 1 : 32d.
Tenrige, 1 : 50d.
Tepestede, 1 : 20s.
Bochelant, 1 : 6s.
Beddingtone, 2 : 40s.
Odemerestor, 1 : 20s.
Taleorde, 1 sine censū.
Ditvne, 1 : 9s.
Meldone, 1 : 12s.
Cisendone, ½ : 11s.
Waletone, 1 : 12s. 6d.
Stoche, 1 : 7s.
Do. 1 : 6s.
Eldeburie, 1 : 5s.
Scaldefor, 3 : 16s.
Tornegrostam, 1 : 20s.
Becesworde, 1 : 10s.
Witford, 1 : 20s.
Michelham, ½ : 20s.
Mildetone, 1 : 2s.
Abingeborne, 1 : 6s.
Padendane, 1 : 6s.
Hormeram, 1 : 11s.
Pipereberge, 1 : 15s.
Avltvne, 1 : 35s.
Waletone, 1 : 12s. 6d.
Hameledone, 1 : 30d.
Clanedun, 1 : 3s.
Svdtone, 1 : 5s.
Beddingtone, 2 : 35s.
Westcote, 1 : 30d.
Sande, 1 : 31s. 6d.
Do. 1 : 2s.
Feceham, 1 : 6s. 6d.
Odetone, 1 : 20d.
Wiselei, 1 : 10s.
Lodesorde, 1 : 11s.

IX. DOMESDAY MILLS.

23. Schedule.

HANTESCIRE. (I. 38.)

Odiham, 8: 56s. 8d.
Neteham, 8½: £4, 14s. 3½d.
Malpedresha, 3: 20s.
Svdbertune, 2: 15s.
Do. 1: 5s.
Menestoche, 1: 10s.
Menes, 6: 40s.
Bertvne, 3: 42s. 6d.
Wallope, 3: 15s.
Do. 3: 25s.
Brestone. In the time of King Edward certain land was given for a mill for this manor; and in the time of King William the mill was accepted and so matters remain.
Dene, 2: 20s.
Do. 1: 30d.
Cladford, 3: 57s. 6d.
Stanevde, 1: 5s.
Edlinges, 2: 25s.
Thvinam, 1: 5s.
Holeest, 1: 15s.
Rinevede, 1: 22s.
Do. 1: 30d.
Borgate, 1: 10s., 1000 eels.
Anne, 1: 7s. 6d.
Andovere, 6: 72s. 6d.
Basingestoches, 3: 30s.
Clere, 2: 100d.
Ticefelle, 1: 20s.
Svbvrne, 3: 15s.
Sandford cum Wica, 2: 70d.
Adrintone, 1: 15s.
Waroshesselle, 2: 20s.
Alresforde, 9: £9, 30d.
Do. 1: 20s.
Tviforde, 4: £4.
Do. 2: £4, 15s.
Estvne, 2: 30s.
Stoches 1: 10s.
Waltham, 3: 17s. 6d.
Menes, 2: 10s.
Do. 1: 30d.
Fernham, 2: 25s.
Do. 3: 16s.
Edintvne, ½: 7s.
Hovstvn, 4: 70s.
Abedestvne, 1: 15s.
Benedlee, 1: 10s.
Ciltecvbe, 4: £4.
Notesselinge, 1: 22s. 8d.
Cilbodentvne, 1: 15s.
Wilcerce, 3: 40s.
Frigefolc, 1: 20s.
Eisseburne, 5: 25s.
Do. 1: 12s. 6d.
Clere, 1: 30d.
Crvndele, 1: 3s.
Fernebergam, 1: 10d.
Drochenford, 2: 15s. 2d.
Benetstede, 1: 10s.
Polemtvne, 2: 33s.
Essessentvne, 2: 20s.
Leuing, 1: 2s.
Ordie, 1: 25s.
Wenesistvne, 1: 7s. 6d.
Brandesberee, 1: 15s.
Eccleswelle, 2: 100d.
Fvgelerestvne, 1: 10s.
Lehtford, 1½: 22s. 6d.
Mireldevre, 1: 30d.
Ordie, 1: 20s.
Brochematvne, 1: 15s.
Havehvnte, 2: 15s.
Basingestochs, 1: 20s.
Avltone, ½: 4s. 7d.
Betametone, 2: for the Hall.
Warneford, 1: 10s.
Staneham, 2: 30s.
Clere, 1: 5s.
Anna, 3: 37s. 6d.
Lavrochestoche, 2: 14s.
Evreslei, 2: 105d.
Lis, 1: 16d.
Froli, 2: 22s. 6d.
Stoches, 1: 20s.
Timbreberie, 1: 12s. 6d.
Ebintvne, ½: 7s.
Romesy, 3: 25s.
Do. 1: 10s.
Stoche, 1½: 22s. 6d.
Dodintvne, 1: 10s.
Warwelle, 3: 27s. 6d.
Tochiton, 2: 35s.
Anna, 2: 30s.

IX. DOMESDAY MILLS.

23. Schedule.

Hantescire—*contd.*

Middeltone, 2 : 40s.
Bolende, 1 : 15s.
Wincestre, 1 : 48s.
Thvinam, 1 : 30d.
Bortel, ⅓ : 25d.
Bailocheslei ½ : 3s.
Croftone, 1 : 12s. 6d.
Fvntelei, 1 : 10s.
Subvrne Hd., 1 : 15s.
Do. 4 : 35s.
Borhvnte, 1 : 42d., and another for the Hall.
Nevtibrige, 1 : 5s.
Bichetone, 1 : 7s. 6d.
Sirebvrne, 3 : 27s. 6d.
Brvmelai, 2 : 20s.
Basinges, 3 : 50s.
Nataleie, 1 : 10s.
Wicheham, 2 : 20s.
Svgion, 1 : 20s.
Hvne, 2 : 20s.
Quedementone, 2 : 22s.
Clere, 1 : 12s.
Lidesette, 1 : 7s. 6d.
Borehunte, 1 : 5s.
Applestede, 1 : 15d.
Effelle, 1 : 5s
Bromselle, ¼ : 10d.
Stradfelle, 1 : for the Hall.
Locherlega, 1 : 10s.
Sirefelle, 1 : 5s.
Anne, 1 : 20s.
Rochesire, 1 : 40d.
Tibeslei, 1 : 10s., 700 eels.
Chenep, 1 : 20s.
Rodbrige, 2 : 50s.
Titegrave, 1 : 50d.
Mapledrewelle, 2 : 32s. 6d.
Ambledvne, 1 : 12d.
Brenbresete, 2 : 100d.
Cerdeford, 1 : 15s., 1200 eels.
Svdtone, 1 : 6s. 3d.
Forde, 2 : 14s. 2d.
Ordie, 3 : 60s.
Sirelei, 1 : 30d.
Botelei, 2 : 20s.
Chenol, 2 : 11s. 3d.
Svantvne, 1 : 15s.
Cheping, 1 : 7s. 6d.

Hantescire—*contd.*

Anne, 1 : 25s.
Subvrne, 1 : 10s.
Bessete, 1 : 40d.
Porgestre, 1 : 30d.
Do. 2 : 5s.
Estrope, 1 : 7s. 0d.
Newentone, 2 : 100d.
Cilbodetune, 1 : 7s. 6d.
Svalefelle, 1 : 25d., which is in Birchesire [Berks].
Svbvrne Hd., 1 : 20s.
Icene, 1 : 20s.
Stradfelle, 2 : 27s. 6d.
Wergeborne, 1 : 10s.
Weringetone, 2: for the Hall: and 450 eels for the [general] grinding.
Dene, 1 : 20s.
Ellatvne, 2 : 20s.
Clere, 3 : 7s. 6d.
Sopelie, 1 : 10s., 875 eels.
Cvntvne, 1 : 20s.
Svdbertvne, 1 : 10s.
Boviete, 2 : 16s.
Hibeste, 1 : 50d.
Werildeham. 1 : 6s. 8d.
Brocheseve, 1 : 5s.
Fvntelei, 1 : 12s. 6d.
Ormeresfelt, 1 : 6s. 6d.
Harlei, 1 : 3s.
Svdtvne, 1 : 6s. 3d.
Nortvne, 1 : 15s.
Berchelei, 1 : 20d.
Matingelege, 1 : 5s.
Tederleg, 2 : 27s. 6d.
Weleve, 2 : 100d.
Etham, ½ : 5s.
Do. ½ : 5s.
Toiber, 1 : 30d.
Adelingeham, 1 : 7s. 6d.
Borgate, 1 : 7s. 8d.
Totintone, ⅓ : 5s.
Do. ¼ : 5s.
Clere, 1 : 50d.
Langelie. Hugo de S. Quintin holds Langelie from the Bishop of Bayeux as he says, by virtue of the exchange of a mill that he had from a man.

Hantescire—*contd.*

Herdel, 1.
Begeslei, 1 : 30d.
Melleford, 1 : 30d.
Einforde, 1 : which is held by a certain custodian for the lord the king.
Broc, 1 : 15d.
Bovecome, 1 : 40d.
Side, 4 : 12s. 6d.
Alwinestvne, 2 : 5s.
Cavborne, 2 : 6s. 3d.
Gatecome, 1 : 40d.
Cavborne, 1 : 5s.

Hantescire—*contd.*

Vlwarcvbe, 1 : 35d.
Witesfel, 3 : 11s.
Alvrestone, 1 : 40d.
Evreland, 1 : 12s.
Sidam, 2 : 5s.
Sorewelle, 1 : 40d.
Seldeflat, 1 : 11d.
Sevtecome, 1.
Sidam, 1 : 10s.
Melevsford, 1 : sine censū.
Essevete, 1 : sine censū.
Socte, 1 : 40s.
Hvncheford, 1 : sine censū.

BERROCHESCIRE. (I. 56.)

Walingeford.
Taceha, 2 : 22s. 6d.
Cocheha, 2 : 22s. 6d.
Blitberie, 3 : 37s. 6d.
Celsea, 3 : 62s.
Bastedene, 1 : 15s.
Wanetinz, 1 : 100d.
Cerletone, 1 : 7s. 6d., which Walter Gifard holds unjustly, as the Hundred says.
Waregrave, 1 : 9s. 2d.
Rameham, 1 : 20s., 1000 eels.
Soanesfelt, 1 : 50d.
Selingefelle, 1 : 5s., 150 eels.
Fuichamestedem, 1 : 7s. 6d.
Chenetberie, 2 : 32s. 6d.
Eseldeborne, 1 : 10s.
Eddevetone, 1 : 15s.
Lamborne, 2 : 20s.
Ledencvbe, 5 : £4.
Seriveham, 2 : 20s.
Ferendone, 1 : 35s., with fishery.
Svdtone, 3 : 50s.
Henret, 1 : 42s.
Stivetone, 3 : 45s.
Ordia, 1 : 12s. 6d.
Redinges, 4 : 35s., increased to 50s.
Pandeborne, 1 : 20s.
Heldremanestvne, 1 : 20s.
Olvricestvne, 2 : 12s. 6d.
Harvvelle, 1 : 30d.
Bristowelle, 1 : 20s.
Soninges, 2 : 12s. 6d.
Do. 1 : 6s. 3d.
Bocheland, 1 : 12s. 6d.
Comenore, 2 : 50s.
Bertvne, 2 : 40s.
Do. 2 : of the Court of the abbot [of Abingdon] : sine censū.
Waliford, 5 : 60s.
Merceham, 1 : 15s.
Wareford, 1 : 7s. 6d.
Hanlei, 1 : 12s.
Middeltvne, 1 : 10s.
Do. 1 : 12s. 6d.
Apleford, 2 : 25s.
Witeham, 1 : 10s.
Wiselai, 1 : 5s., 250 eels.
Lewartone, 1 : 10s.
Wachenesfeld, 1 : 25s.
Offentone, 1 : 5s.
Spersold, 1 : 5s.
Serengeford, 1 : 30d.
Gainz, 1 : 6s. 6d.
Eissesberie, 1 : 12s. 6d.
Sotwelle, 1 : 15s.
Coleselle, ½ : 10s.
Reddinges, 2 : 40s.
Cheneteberie, 1 : 4s.
Sewelle, 1 : 10s.
Borgedeberie, 1 : 4s.
Colecote, 1 : 4s.
Blitberie, 1 : 4s.
Hannei, 1 : 12s. 6d.

IX. DOMESDAY MILLS.

23. Schedule.

Berrochescire—*contd.*

Hannei, 1: 7s. 6d., which appertains to the manor of Cerletone, as the Hundred says.
Warengeford, 1: 4s.
Greneham, 1½: 11s.
Bechesgate, 1: 11s.
Cerletone, ½: 5s.
Slanford, 2: 7s. 6d.
Borgefelle, 1: 5s. 10d.
Ollavintone, 1: 15s.
Inglefelle, 1: 10s.
Bradefelt, 3: 53s.
Etingedene, 1: 5s.
Stanworde, 1: 12s.
Hingepene, 1: 12s. 6d.
Peteorde, ½: 7s. 6d.
Svdcote, 1: 18s.
Deretone, 1: 15s.
Mortvne, 1: 12s. 6d.
Tanebvrne, 1: 20s.
Mortvne, 1: 12s. 6d.
Coleshalle, ⅓: 10s.
Celrea, 1: 4s.
Hacheborne, 1: 12s.
Pangeborne, 1: 10s.
Clopecote, 1: 26s.
Bedretone, 1: 5s.
Migeham, 1: 14s.
Hannei, 2: 30s.
Lamborne, 2: 15s.
Herlei, 1: 20s.
Estralei, 1: 22s.
Brintone, 2: 26s. 3d.
Ledecvbe, 2: £3.

Berrochescire—*contd.*

Siford, 1: 8s.
Ardintone, 1: 11s. [Edwin's].
Do. 2: 25s. [Saumin's]. Cola, an Englishman, claimed one of these mills, but Alurin and Godwin and Aluric testified that it always lay in Ardingtone [manor].
Avintone, 1: 10s.
Siford, ½: 7s. 6d.
Celrea, 1: 50d.
Brintone, 1: 12s.
Stradfeld, 1: sine censū.
Borgefel, ½: 5s. 10d.
Cerletone, ½: 5s.
Brochentone, 1: 5s.
Clivore, 1: 10s.
Vlvrétone, 2: 50s.
Essages, 1: 20s.
Porlei, 1: 10s.
Bagenore, 1: 20s.
Spone, 1: 22s.
Bochesorne, 1: 27s. 6d.
Coleselle, ⅓: 10s.
Celrea, 1: 2s.
Siford, 2: 22s. 6d.
Hamestede, 1: 20s.
Ebrige, 1: 30s.
Walsinge, 1: 16s.
Hacheborne, 1: 12s. 6d.
Henret, 1: 10s.
Peteorde, 2½: 37s. 6d.
Dvdochesforde, 1: 5s.
Acenge, 1: 15s.
Henret, 1: 20s.

WILTESCIRE. (I. 64.)

Sarisberie, ½: 20s., by weight. (See Hertforde, Herts.).
Cavna, 7.: £4, 12s. 6d.
Do., 2: 20s.
Bedvnde, 8: 100s.
Amblesberie, 8: £4, 10s.
Gverminstre, 7: £4.
Chepeham, 12: £6.
Malmesberie, 1: 10s.
Bretford, 2: 20s.
Theodvlveside, 9: 100s. 30d.
Contone, 1: 12s. 6d.
Rvsteselve, 5: 72s.
Aldeborne, 4: 16s. 8d.
Cosseham, 2: 8s. 6d.
Melchesham, 6: £7, 6s.
Cvmbe, 2: 25s.
Bromham, 2: 5s.
Westberie, 6: 70s. 6d.
Wintrebvrne, 1: 10s.
Lidiarde, 1: 32d.
Dvntone, 7: 60s.

Wiltescire—*contd.*

Fontel, 1 : 5s.
Awltone, 2 : 12s.
Westwode, 1 : 10s.
Elendvne, 6 : 42s. 6d.
Wemberge, 1 : 5s.
Enedforde, 2 : 25s.
Stottvne, 1 : 10s.
Poterne, 6 : 43s. 4d.
Cainingham, 6 : 7s. 6d.
Ramesberie, 10 : £6, 30d.
Wiltune, 4 : 47s. 7d.
Do., ½ : 30s.
Svindvne, 1 : 4s.
Dechementvne, 4 : 27s.
Withenham, 1 : 12s. 6d.
Winefel, 1 : 20s.
Liteltone, 1 : 7s. 6d.
Wintrebvrne, 1 : 12s. 6d.
Etvne, 1 : 10s.
Svmreford, 1 : 10s.
Dobreham, 4 : 20s.
Hanindone, 2 : 8s.
Devrel, 1 : 5s.
Cristemeleforde, 2 : 40s.
Badeberie, 1 : 40d.
Mildenhalle, 1 : 30s.
Niteletone, 3 : 22s. 6d.
Wintrebvrne, 1 : 15s.
Devrel, 3 : 14s. 10d.
Dantesie, 1 : 20s.
Svmreford, 1 : 20s.
Nortone, 1 : 15s.
Brocheneberge, 8 : £6, 12s. 6d.
Corstone, 1 : 12s. 6d.
Chemele, 2 : 15s.
Celeorde, 1 : 10s.
Newentone, 2 : 30s.
Cerletone, 1 : 15s.
Gardone, 2 : 25s.
Breme, 1 : 16s. Of this land Edward holds four hides and Eodric four hides: and here is a mill between them yielding 16s.
Do. 2 : 30s.
Piritone, 1 : 5s.
Maneforde, 1 : 12s. 6d.
Pevesei, 7 : £4, 5s.
Chiseldene, 1 : 40d.
Essitone, 1 : 5s.

Wiltescire—*contd.*

Bichenestoch, 1 : 12s.
Tisseberie, 4 : 35s.
Dvneheve, 8 : 66s. 8d.
Bradeforde, 2 : £3.
Ledentone, 2 : 5s.
Domnitone, 2 : 12s. 6d.
Stantone, 2 : 12s. 6d.
Newetone, 1 : 12s. 6d.
Darneford, 1 : 7s. 6d.
Chilmerc, 1 : 10s.
Ovretone, 1 : 10s.
Chelche, 5 : 65s.
Newentone, 2 : 40s.
Wilgi, 1 : 10s.
Wicheford, 2 : 24s.
Langeford, 1 : 5s.
Ocheforde, 1 : 5s.
Bredecvbe, 1 : 15s.
Febefonte, 2 : 17s. 6d.
Lavvregestohes, 1 : 7s. 6d.
Ierchesfonte, 3 : 21s. 4d.
Caninge, 1 : 13s.
Edendone, 2 : 19s.
Aistone, 3 : 32s. 6d.
Boltintone, 2 : 65s.
Devrel, 1 : 30d.
Uptone, 1 : 20s.
Latone and Aire, 2.
Langeford, ½ : 3cd.
Wintreslev, 1 : 5s.
Ettone, 1 : 15s. 6d.
Retmore, 1 : 14s.
Bredecvbe, 1 : 10s.
Fiscartone, 1 : 10s.
Contone, 1 : 10s.
Tedrintone, ½ : 30d.
Alentone, 1 : 20s.
Stradford, 2 : 17s. 6d.
Awltone, 1 : 10s.
Wrdervsteselle, 1 : 18d.
Wintrebvrne, 1 : 5s.
Stoche, 1 : 30d.
Somreforde, part : 15d.
Blontesdone, 1 : 25d.
Boientone, 1 : 15s.
Pole, 1 : 10s.
Bicopestrev, 1 : 15s.
Termtone, ¼ : 20d.
Lacoch, 2 : 17s. 6d.

IX. DOMESDAY MILLS.

23. Schedule.

Wiltescire—*contd.*

Depeford, 1 : 10s.
Werocheshalle, 2 : 18s.
Poertone, 1 : 32d.
Wintrebvrne, 1 : 15s.
Chivele, 2 : 55s.
Poterne, 1 : 7s. 6d.
Chevrel, ½ : 30d.
Calestone, 1 : 15s.
Standom, 1 : 6s.
Caldefelle, ½ : 18d.
Helmerintone, 1 : 7s.
Rode. 2 : 9s. 8d. William holds 18 hides, Gislebert 1 hide, and Vluiet 1 hide: here are two mills belonging to William rendering 9s. 8d.
Tefonte, 1 : 10s.
Crostone, 1 : 30s.
Newentone, 1 : 10s.
Wildehille, 1 : 25d.
Opetone, 1 : 20s.
Nortone, 2 : 40s.
Clive, 1 : 5s.
Svmreford, 1 : 5s.
Horningham, 1 : 7s. 6d.
Chenete, 1 : 12s.
Tedelintone, 2 parts : 40d.
Broctone, 2 : 9s.
Contone, ⅓ of 2 : 10s.
Sterte, 2 : 8s.
Rvsteselle, 1 : 12d.
Wertvne, 1 : 15d.
Svmreford, ⅓ : 8s.
Suntecote, 1 : 5s.
Schetone, ½ : 6s. 3d.
Wili, 1 ; 15s.
Wilrenone, 1 : 6s.
Colerne, 1 : 13s. 6d.
Goltone, 1 : 15s.
Come, 3 : 31s. 6d.
Sorestone, 2 : 10s.
Hardicote, 1 : 6s.
Wodetone, 1 : 30d.
Cilletone, 2 : 40s.
Ochebvrne, 1 : 30s.
Haseberie, 2 : 35s.
Cheseberie, 2 : 20s.
Clive, 1 : 5s.
Ceritone, 1 : 10s.

Wiltescire—*contd.*

Tocheham, 1 : 50d.
Lochintone, 1 : 5s.
Bradelie, 2 : 12s. 6d.
Diarneford, 3 : 24s. 6d.
Liteltone, 2 : 30s.
Contone, 2 : 10s.
Cerletone, 2 : 8s. 4d.
Adhelmertone, 1 : 7s.
Coteford, ¼ : 3s.
Digeric, ½ : 5s.
Lachlam, 2 : 30s.
Opetone, 1 : 5s.
Svtone, 1 : 4s.
Stortone, 2 : 20d.
Coleford, 1 : 10s.
Anestige, 1 : 5s.
Langeford, 1 : 15s.
Do. ½ : 30d.
Dvene, 1½ : 16s.
Herdicote, ½ : 6s.
Svtone, 2 parts : 13s. 4d.
Svdtone, 1 : 10s.
Clatford, 1 : 20s.
Chintone, 1 : 2s.
Aldritone, 1 : 37d.
Witeberge, 1 : 12s. 6d.
Brismartone, 1 : 12s.
Mildestone, 1 : 18s.
Wiflesford, 1 : 10s.
Viteletone, 1 : 22s. 6d.
Fisertone, 1 : 20s.
Foxelege, 1 : 7s. 6d.
Estone, 1 : 6s.
Fontel, 1 : 5s.
Coteford, 4 parts : 4s. 4½d.
Devrel, 1 : 30d.
Scarentone, ½ : 7s. 6d.
Ogeford, 1 : 4s.
Coleselle, 2 : 22s. 4d.
Aldrintone, part : 22d.
Wichelestote, 1 : 5s.
Cortitone, 1 : 20s.
Calestone, 1 : 15s.
Stratone, 1 : 2s.
Chesigeberie, 1 : 7s. 6d.
Svdtone, ⅓ : 6s. 8d.
Calestone, 2 : 33s. 6d.
Laventone, 2 : 16s. 4d.
Do. 1 : 5s.

Wiltescire—*contd.*

Chipeham, ½: 15s.
Sele, 1: 40d.
Wintrebvrne, ½: 3s. 9d.
Meresdene, 1: 7s.
Manisford, ½: 5od.
Wochesie, 1: 5s.
Covelstone, 1: 10s.
Strabvrg, 1: 10s.
Stavretone, 1: 20s.
Odestote, 1: 7s. 6d.
Cvnvche, 1: 15s.
Wadone, 1: 5s.
Svinreford, part: 15d.
Do. part: 15d.
Do. part: 15d.
Sela, 1: 3s.
Corselie, 1: 40d.
Bimertone, 1: 12s. 6d.
Wintrebvrne, part: 22½d.
Anestige, 1: 25d.
Manisford, 2 parts: 12s. 6d.

Wiltescire—*contd.*

Stotecome, 1: 15s.
Widetone, 1: 10s.
Pleiteford, 1: 10d.
Gramestede, 1: 10s.
Wenistetone, 1: 10s.
Fisgledene, 1: 15s.
Contone, ⅓ of 2: 10s.
Langeford, 1: 5s.
Titicome, 1: 15s.
Cvnvche, 1: 15s.
Langeford, 1: 20d.
Stapleford, 2: 30s.
Wintrebvrne, part: 22½d.
Vlfela, 1: 16s.
Wesberie, 2: 25s.
Draicote, 1: 5s.
Tornvelle, 1: 5s.
Svindone, 1: 4s.
Clive, 1: 5s.
Devrel, 1: 4s.
Wicheford, 1: 15s.

DORSETE. (I. 75.)

Bridetone, Berie, &c., 8: £4, 35d.
Winborne, 8: 110s.
Dorcestre, 12: £6, 5s.
Pinpre, 2: 40s. 6d.
Winfrode, 4: 50s.
Acford, 2: 20s.
Piretone, 2: 32s.
Calvedvne, 1: 10s.
Lodres, 2: 23s. 4d.
Litelfrome, 1: 4s.
Crenebvrne, 4: 18s.
Medesham, 1: 5s.
Wichemetvna, 1: 10s.
Tarente, 1: 4s.
Watrecome, ½: 4s.
Cerminstre, 1: 6s.
Altone, 1: 15s.
Obcerne, 1: 15s.
Etiminstre, 1: 5s.
Hinetone, 1: 10s.
Do. 1: 5s.
Winbvrne, 1: 5s.
Scirebvrne, 4: 18s. 6d.
Do. 3: 30d.
Do. 1: 10s.
Scirebvrne, 3: 22s.
Do. 1: 5s.
Torneford, 1: 12s. 6d.
Bradeford, 1: 15s.
Contone, 1: 10s.
Staplebrige, 1: 15s.
Corscvbe, 1: 5s.
Stoche, 1: 5s.
Beiminstre, 1: 20d.
Do. 2: 28d.
Niderberie, 1: 10s.
Do. 1: 5s.
Cerdestoche, 2: 20s.
Pidele, 1: 67d.
Wintrebvrne, 1: 16d.
Do. 1: 15d.
Tarente, 1: 5s.
Do. 2: 30s., 1000 eels.
Newentone, 3: 40s.
Do. 1: 3s. 9d.
Adford, 1: 5s.
Pidrie, 3: 60s.
Tarente, 1: 5s.
Cerneli, 1: 20s.
Affapidele, 2: 15s.

IX. DOMESDAY MILLS.

23. Schedule.

Dorsete—*contd.*

Virgroh, 1½.–
Langebride, 1 : 6s.–
Mideltone, 1 : 65d.–
Sidelinge, 2 : 7s. 6d.–
Mideltvne, 1 : 15s.
Stoche, 1 : 15d.
Pidele, 1 : 40d.–
Osmentone, 1 : 5s.–
Ertacomestoche, 3 : 37d.–
Cerne, 1 : 20d. In the possession of Cerne Abbey in the time of King Edward, and could not be separated from the Church. –
Abedesberie, 2 : 16s. 3d.–
Pidele, 2 : 20s.–
Eltone, 1 : 20d.
Portesham, 1 : 10s.–
Hortvne, 2 : 15s. –
Oscherwille, 2 : 7s. –
Frantone, 2 : 20s. –
Haintone, 1 : 10s.–
Stvre, 3 : 30s. –
Fontemale, 3 : 11s. 7d.
Cvntone, 1 : 50d.–
Meleberie, 3 : 15s. 3d.–
Evneminstre, 3 : 17s.–
Fifhide, 1 : 5s. –
Stoche, 1 : 12d.–
Cesebvrne, 1 : 15s.–
Dedilintone, 1 : 12s. 6d.–
Winbvrne, 1 : 7s. 6d.–
Wintrebvrne, 1 : 12s. 6d.–
Cernel, 1 : 10s.–
Hanford, 2 : 16s. –
Acford, ½ of 2 : 10s.
Stanford, 1 : 4s.–
Cerne, 1 : 5s. –
Do. 1 : 40d.–
Wai, 2 : 20s. –
Do. 2 : 32s.
Pidele, 1 : 40d.
Do. 1 : 40d
Mordone, 1 : 6s. 3d.–
Sidelince, 1 : 5s.–
Liteltone, 1 : 7s. 6d.
Winbvrne, 1 : 2s. –
Wichemetone, 1 : 5s.
Lodre, 1 : 3s.–

Dorsete—*contd.*

Chenoltvne, 1 : 12s. 6d. –
Gessic, 1 : 25s. –
Blaneford, 1 : 20s. –
Stoches, 1 : 15s.–
Stanberge, 1.–
Mortone, 1 : 3s.–
Lahoc, 1 : 6s.–
Wodetone, 1 : 15d.–
Cerfeli, 1 : 3d. [this and Svndone in Somerset being the lowest cash rentals in the list].
Fifhide, 2 : 22s. 6d.–
Lelsametone, 1.
Clistone, 1 : 10s.–
Do. 1 : 50d. –
Warmemilld, 1 : 5s.–
Pedrat, 1 : 2s. –
Stvr, 1 : 100d.–
Stvrminstre, 2 : 28s. –
Corf, 1 : 20s. –
Iwerne, 1 : 3s.–
Povintone, 1 : 25s.
Cheneford, 2 : 15s. –
Chinestanestone, 1 : 5s.–
Adelintone, 1 : 15s.–
Bradeford, 2 : 20s.–
Svere, 1 : 16s. –
Wenfrot, 1 : 10s.
Frome, 1 : 10s. –
Werne, 2 : 12s.–
Poleham, 1 : 40d.–
Hame, 1 : 7s. 6d. –
Spehtesberie, 1 : 12s. 6d –
Frome, 1 : 10s. –
Malperetone, 1 : 5s.–
Seltone, 3 : 5s.–
Milletone, 1 : 15d.–
Todeberie, 1 : 10s. –
Ristone, 1.–
Chenistetone, 2 : 12s.–
Candelle, 1 : 9s. –
Do. 1 : 3s.–
Manestone, 2 : 12s. –
Svdtone, 1 : 7s. 6d.–
Fifhide, 1 : 40d.–
Newetone, 2 : 20s.
Tolre, 1 : 30d. –
Mordvne, 1 : 45d.–
Bridie, 1 : 10s. –

Dorsete—*contd.*

Melebvrne, 1 : 32d.
Ogre, 1 : 6s.
Meleberie, 1 : 5s.
Povestoch, 2 : 3s.
Brocheshale, 1 : 5s.
Orde, 1 : 7s. 6d.
Pidere, 1 : 3s.
Odetvn, 2 : 15s.
Chirge, 1 : 20s.
Amedesham, 1 : 30d.
Stvre, 1 : 3s.
Ringestede, ½ : 4s.
Cernel, 1 : 30d.
Mortestorne, 1 : 7s. 6d.
Alford, 1 : 33s. 6d.
Wintrebvrne, 1 : 16d.
Frome, 1 : 5s.
Geoselbvrne, 1 : 30d.
Bocheland, 1 : 20s.
Waia, 3 : 35s.
Do. 3 : 37s. 6d.
Winbvrne, ⅓ : 15d.
Bere, 1 : 20s.
Sterte, 1 : 6s. 3d.
Gravestan, 1 : 7s. 6d.
Penaganole, 1 : 12s. 6d.
Wintrebvre, 1 : 5s.

Dorsete—*contd.*

Tarente, 1 : 30d.
Warnewelle, 1 : 5s.
Harpere, 1 : 20d.
Tacatone, 1 : 12s. 6d.
Pitrichesha, 1 : 5s. 10d.
Mideltone, 1 : 12d.
Waia, 1 : 15s.
Craveford, ¼ : 30d.
Mordone, part : 11d.
Hame, 1 : 10s.
Eleneford, 1 : 18s. 4d.
Werm, 1 : 2s. 4d.
Povrtone, 1.
Ciltecome, 1 : 5s.
Gaveltone, 1 : 12s. 6d.
Stoche, 1 : 40d.
Pidele, 1 : 7s. 6d.
Meleborne, 1 : 25d.
Frome, 1 : 5s.
Wintrebvrne, 3 parts : 9s.
Winbvrne, 1 : 22d. : the mill of the town.
Waldie, 1 : 45d.
Wardesford, 1 : 6s.
Lime, 1 : 39d.
Bochehatone, 1 : 5s.
Moleham, 1 : 6d.

SVMERSETE. (I. 86.)

Alsebrvge, 2 : 12s. 6d.
Nortperet, 1 : 15d.
Svdperet, 1 : 20s.
Willetone, Candetone, and Carentone, 2 : 5s.
Beiminstre, 1 : 5s.
Fromie, 3 : 25s.
Brvmetone, 6 : 20s.
Milebvrne, 6 : 77s. 6d.
Brvnetone, 2 : 3s.
Clive, 2 : 54d.
Langeford, 1 : 7s. 6d.
Winesford, 1 : 6d.
Crice, 1 : 8d.
Crvche, 4 : 40s.
Cvngresberie, 2 : 7s. 6d.
Camel, 2 : 20s.
Cocre, 1 : 5s.
Hesterige, 1 : 30d.
Milvertone, 1 : 7s. 6d.
Mertoch, 2.
Cainesham, 6 : 60s.
Beletone, 1 : 15s.
Stantone, 1 : 10s.
Cuvetvne, 5 : 30s. 5¼d.
Estone, 2 : 100d.
Tantone, 3 : 100s.
Do. 1 : 3s.
Do. 2 : 6s. 8d.
Do. 2 : 14s. 2d.
Seveberge, ½ : 10d.
Contone, 1 : 30d.
Stoches, 1 : 3s.
Harpetrev, 1 : 5s.
Clvtone, 1 : 30d.
Temesbare, 2 parts : 3s.
Do. ⅓ : 2s.
Nortone, 1 : 40d.

IX. DOMESDAY MILLS.

23. Schedule.

Sŭmersete—*contd.*

Sanford, 1: 12s. 6d.
Estone, 1: 50d.
Porteshe, 1: 8s.
Bacoile, 1: 4s.
Bvdiconae, 1: 20d.
Berve, 1: 5s.
Porberie, 2: 6s.
Estvne, 1: 40d.
Firford, ½: 5s.
Lancheris, 1: 40d.
Wiche, 1: 35s.
Wilege, 2: 2s.
Contone, 2: 25s.
Werocosale, 2: 12s. 6d.
Wenfre, 1: 40d.
Fvscote, 1: 10s.
Stratone, 1: 5s.
Picote, 1: 40d.
Engliscome, 2: 11s. 7d.
Tvvertone, 2: 30s.
Stoche, 1: 13s.
Babingtone, 1: 40d.
Millescote, 1: 6s. 6d.
Lolictone, 1: 20s.
Horcerlei, 1: 12s. 6d.
Tablesford, ½: 7s. 6d.
Do. ½: 9s.
Rode. From the mills issue, 27s.
Caivel, 1: 30d.
Liteltone, 1: 10s.
Nievetone, 1: 7s. 6d.
Estone, 1: 30d.
Herpetrey, 1: 5s.
Camelei, 1: 5s.
Liteltone, 1: 50d.
Weregrave, 1: 3s.
Welle, 4: 30s.
Do. 2: 50d.
Do. 2: 10s.
Do. 1: 7s. 6d.
Chingesberie, 2: 30d.
Cerdre, 1: 30d.
Wivelscome, 1: 50d.
Walintone, 2: 15s.
Lidegar, 1: 31d.
Banwelle, 1: 10s., payable to Richard.
Do. 1: 40d., payable to Ordolph.

Sŭmersete—*contd.*

Evrecriz, 1: 7s. 6d.
Winesham, 2: 20s.
Chivve, 3: 20s.
Do. 2: 10s.
Litvne, 3: 10s.
Bade, 1: 20s.
Prisctone, 1: 7s. 6d.
Wimedone, 1: 5s.
Westone, 1: 10s.
Forde, 1: 10s.
Cvme, 2: 13s. 6d.
Lincvme, 2: 10s.
Estone, 2: 6s. 8d.
Vndewiche, ½: 5s.
Corstvne, 1: 30d.
Winescome, 1: 5s.
Lideford, 1: 10s.
Piltone, 2: 10s.
Coristone. 2: 6s. 3d.
Piltone, 2: 4s. 6d.
Baltvnesberge, 1: 5s.
Cerletone, 1: 9d.
Batecvbe, 1: 5s.
Westcvbe, 2: 5s.
Mvlle, 1: 5s.
Watelei, 1: 5s.
Weretone, 3: 14s. 2d.
Dicesget, 1: 7s. 5d.
Lamieta, 3: 13s. 4d.
Camelertone, 2: 5s.
Crenemelle, 1: 30d.
Ileminstre, 3: 22s. 6d.
Ile. 1: 15s.
Camelle, 1: 10s.
Atiltone, 1: 7s. 6d.
Crvche, 1: 5s.
Monteburg, 1: 30d.
Lands of St. Andrews, 1: 20s.
Church of Frome, 1: 5s.
Bera, 1: 6d.
Newentone, 1: 15d.
Locheston, 1: 6d.
Belgetone, 1: 15s.
Conititone, 1: 64d.
Sanford, 1.
Crvche, 1: 12s.
Sevenehantone, 1: 5s.
Slantvne, 1: sine censū.
Isle, 1: 14s.

Sŭmersete—*contd.*

Tintehalle, 1 : 30d.
Stochel, 1 : 40d.
Draicote, 1 : 15s.
Stoche, 2 : 9s.
Brvcheford, 1 : 12s. 6d.
Aisse, 2 : 15s.
Grindeham, 1 : 5s.
Domet, 1 : sine censū.
Staple, 1 : 30d.
Meriet, 3 : 30s.
Estham, 1 : 12s.
Prestitone, 1 : 12d.
Harpetrev, 1 : 5s.
Bredene, 1 : 12s. 6d.
Bradeford, 1 : 10s.
Hele, 1 : 10s.
Nortone, 2 : 11s. 3d.
Cinioch, 1 : 15d.
Peret, 2 : 14s.
Vdecome, 1 : 7s. 6d.
Ceolseberge, 1 : 15s.
Cinioch, 1 : 10s.
Nortone, 2 : 20s.
Clovewrde, 1 : 15s.
Claford, 1 : 3s.
Gerlintvne, 1 : 7s.
Vfetone, 1 : 30d.
Svtone, 1 : sine censū.
Do. 1 : 7s. 6d.
Credelincote, 1 : 5s.
Stoche, 1 : 10d.
Aldedeford, 1 : 7s.
Westone, ½ : 30d.
Gateline, 1 : 10s.
Melebvrne, 1 : 16d.
Ponditone, 1 : 32d.
Givele, 1 : 5s.
Biscopeston, 1 : 50d.
Mvndiford, 1 : 20s.
Cerdesling, 1 : 6d.
Godelege, ½ : 10d.
Holecvbe, 1 : 6d.
Perredeham, 1 : 12d.
Cildetone, ½ : 20s.
Radeflote, 1 : 6d.
Svndone, 1 : 3d. (This and Cerfeli, Dorset, are the lowest money rentals on the list.)
Widiete, 1 : 6d.

Sŭmersete—*contd.*

Clive, 1 : 6s.
Hille, 1 : 12d.
Sanford, 1 : 8d.
Torne, 1 : 10s.
Ache, 1 : 4s.
Brinetone, 1 : 30d.
Bertone, 1 : 5s.
Limintone, 1 : 20s.
Halse, 1 : 10s.
Hiwis, 1 : 12d.
Wislagetone, 1 : 15s.
Fitintone, 2 : 2s.
Scheligate, 1 : 10d.
Radingetone, 1 : grinding for the Hall.
Chedesford, 1 : 7s.
Opecedre, 1 : 3s.
Svtone, 1 : 16s.
Bechintone, 1 : 20s.
Birchelei, 1 : 12s. 6d.
Mersitone, 1 : 6s.
Peune, 1 : 40d.
Werre, 2 : 42s.
Wincaletone, 1 : 30d.
Cari, 3 : 34s.
Spercheford, 1 : 7s. 6d.
Almvndesford, 1 : 7s. 6d.
Brvgie, 1 : 5s.
Bagetrepe, 1 : 4s.
Contvne, 1 : 6d.
Harpetrev, 1 : 5s.
Stochelande, 1 : 10d.
Torre, 2 : 10s.
Bvrnetone, 1 : 30d.
Clatevrbe, 1 : 6d.
Vdecome, 1 : 5s.
Mancheve, 1 : 3s.
Langeham, 1 : 3s.
Avena, 1 : 20d.
Nuvetvne, 1 : 40d.
Elwrde, 1 : 4s.
Willet, 1 : sine censū.
Wacet, 1 : 10s.
Tvrvestone, 1 : sine censū.
Holeford, 1 : 10d.
Haretrev, 1 : 6d.
Come, 1 : sine censū.
Badeheltone, 1 : 7s. 6d.
Rvnetone, 1 : 5s.

IX. DOMESDAY MILLS.

23. Schedule.

Sŭmersete—*contd.*

Lidiard, 1 : 8s.
Herfeld, 1 : 30d.
Noivn, 1 : 30d.
Briweha, 2 : 9s. 2d.
Hantone, 2 : 7s. 6d.
Geveltone, 2 : 30s.
Hantone, 1 : 4s.
Ivle, 1 : 10s.
Stoche, 1 : 16d.
Otone, 1 : 10d.
Horstenetone, 1 : 42d.
Cantocheheve, 1 : 7s. 6d.
Hewis, 1 : 3s.
Selevrde, 1 : 20d.
Alresford, 1 : 15d.
Cerletone, 1 : 5s.
Selvre, 1 : 3s.
Stalvvei, 1 : 4d.
Ile, 1 : 20d.
Prestetone, 1 : 20d.
Malrige, 1 : 6d.
Hille, 1 : 30d.
Lochintone, 1 : 10s.
Pidecome, 2 : 15s.
Cadeberie, 2 : 22s.
Westone, ½ : 45d.
Cvntone, 1 : 8s.
Malpertone, 2 : 5s. 5d.
Dvncretone, 1 : 7s. 6d.

Sŭmersete—*contd.*

Blachedone, 2 : 5s.
S. Aldvic's, 1 : 3s.
Lovintvne, 1 : 10s.
Nortone, 1 : 5s.
Telvve, 2 : 100d.
Hantone, 2 : 34s.
Nortvne, 1 : 5s.
Westone, 1 : 20s.
Reddene, 2 : 15s.
Tvmbeli, 1 : 30d.
Mideltone, 1 : 5s.
Melecome, 1 : 12d
Candetone, 1 : 5s.
Bertvne, 1 : 10s.
Picote, 1 : 50d.
Meriet, 1 : 5s.
Dvnintone, 1 : 8d.
Stawe, 1 : sine censū.
Stoche, 1 : 6s. 8d.
Halberge, 1 : 5s.
Wiche, 1 : 5s.
Brochelande, 1 : 7s.
Cvme, 1 : 50d.
Lideford, 1 : 15s.
Timesberie, 1 : 40d.
Estone, 1 : 5s.
Claftertone, 1 : 7s. 6d.
Grenedone, 1 : 30d.

DEVENESCIRE. (I. 100.)

Svlfretone, 3 : 20s.
Alseminstre, 2 : 10s.
Cvlitone, 1 : 40d.
Chentone, 1 : 50d.
Wodeberie, 1 : 7s. 6d.
Tovretone, 2 : 66d.
Coletone, 1 : 7s. 6d.
Chenemetone, 1 : 5s.
Witeford, 1 : 5s.
Clistone, 1 : 20s.
Halsbretone, 2 : 10s.
Critetone, 1 : 30d.
Cvlmestoche, 1 : 5s.
Stoche, 2 : 30s.
Taletone, 1 : 50d.
Nimetone, 1 : 40d.
Barnestaple, 1 : 20s.

Bovi, 1 : 10s.
Vlpesse, 1 : 12s.
Do. 1 : 20s.
Tavestoch, 1 : serving the Court.
Adrelia, 1 : 6d.
Otrei, 3 : 30s.
Otritone, 3 : 40s.
Herticome, 1 : 6s.
Honetone, 1 : 6s. 6d.
Lodebroc, 1 : 2s.
Donicestone, 1 : 7s. 6d.
Alwiniestone, 1 : 8d.
Bichelie, 1 : 5s.
Offers, 1 : 6s. 8d.
Chent, 1 : 30d.
Hantone, 1 : 4s.
Holecome, 2 : 10s.

Devenescire—*contd.*

Hanberie, 1: 40d.
Chentesberie, 1: 5s.
Bernardesmore, 1: 5s.
Coic, 1: 10s.
Essoic, 1: 10s.
Hidone, 1: 30d.
Colvn, 1: 30d.
Brenford, 1: 8s.
Otrit, 1: 5s.
Chetelescome, 1: 2s.
Vlveberie, 1: 5s.
Mvsberie, 1: 5s.
Corneorde, 1: 15s.
Forde, 1: 30d.
Line, 1: new.
Alforde, 1: 30d.
Derte, 1.
Poldreha, 1: 50d.
Baentone, 1: 10s.
Depeforde, 1: 8d.
Offecome, 2: 10s.
Otri, 1: 10s.
Stoch, 1: serving the Hall.
Gidesha, 1: 10s.

Devenescire—*contd.*

Come, 1: 4s.
Herstanhaia, 1: 15d.
Carsewelle, 1: 5s.
Tale, 1: 5s.
Orescome, ½: 5s.
Hochesham, 1: 6s.
Otri, 1: 20d.
Smarige, 1: 5s.
Wigesgroste, 2: 7s. 6d.
Hevtrove, 1: 30d.
Lambretone, 2: 9s.
Brije, 1: 4s.
Cvbe, 1: 5s.
Wideworde, 1: 5s.
Mochelesberie, 1: 60d.
Lege, 1: 36d.
Hanberie, 1: 10s.
Willelande, 1: 40d.
Wogwel, 1: 30d.
Colvm, 1: 25s.
Cadelie, 1: 4s.
Boleham, 1: 7s.
Nuvetone, 1: 32d.

CORNVALGIE. (I. 120.)

Conarditone, 1: 30d.
Cargav, 1: 30d.
Liscarret, 1: 12s.
Dvnhevet, 2: 40s.
Trawiscort, 1: 2s.

MIDELSEXE. (I. 127.)

Stibenhede, 4: £4, 16s. 4½d. The Bishop of London holds Stepney. Here are four mills yielding £4, 16s. 4½d.

Do. 1: Doding holds one virgate of land and one mill in the said manor of the bishop, and cannot give nor sell the same without his license.

Do. 1: 66s. 8d. Hugo de Berneres holds in the said town under the bishop [certain lands], and also one mill rendering 66s. 8d.

Do. 1: 22s. 6d. In the same town Edmund, son of Algot, holds under the bishop one mill, value 22s. 6d. It was not here in the time of King Edward.

Do. 1: 20s. Aluuin, son of Britmar, holds in the same town one mill, value 20s.

Hesa, 1: 4s.
Draitone, 1: 13s. 5d.
Staines, 6: 64s.
Hanewell, 1: 2s. 2d.
Covelie, 1: 5s.
Hermodesworde, 3; 60s., 50 eels.
Coleham, 2: 41s.
Do. ½: 5s.
Adelmetone, 1: 10s.
Enefelde, 1: 10s.
Chingesberie, 1: 3s.
Stanwelle, 4: 70s.
Gistelesworde, 2: 10s.
Herefelle, 2: 15s.

IX. DOMESDAY MILLS.

HERTFORDSCIRE. (I. 132.)

23. Schedule.

Hertforde, 3: £10, ad numerum: by number not weight of coins. (See Sarisberie, Wilts.)
Wimvndeslai, 1: 20s.
Hiz, 4: 53s. 4d.
Cerletone, 1: 20d.
Deneslai, 2: 16s.
Begesford, 2: 26s.
Watone, 2: 17s.
Hadam, 1: 4s.
Wideford, 1: 5s.
Storteford, 2: 30s.
Pvteham, 2: 10s. 8d.
Sutreschele, 1: 16d.
Do. 1: 4s.
Radeuuelle, 1: 8s.
Kamintone, 1: 8s.
Eia, 1: 3s.
Torinch, 1: 5s.
Bigrave, 1: 10s.
Hetfelle, 4: 47s. 4d.
Wetamestede, 4: 40s.
Eldeham, 1: 5s.
Aiete, 1: 6s. 8d.
Escewelle, 2: 14s.
Do. 1: 10s.
Henamesteda, 2: 20s.
Sandrige, 1: 10s.
Waldene, 2: 15s.
Villa S. Albani, 3: 40s.
Codicote, 2: 12s.
Nortone, 2: 16s.
Langelai, 2: 20s.
Redborne, 2: 26s.
Absa, 1: 10s.
Prichemareworde, 1: 5s. 4d.
Caisov, 4: 26s. 8d.
Hegæstanestone, 2: 3s. 4d.
Brichendone, 1: 8s.
Berchewastede, 2: 20s.
Wigentone, 1: 5s.
Bublecote, 1: 12s. 4d.
Hamelamestede, 4: 37s. 4d., 300 eels, less 25.
Langelei, 2: 16s.
Mvndene, 1: 10s.
Cestrehvnt, 1: 10s.
Trevnge, 2: 9s.
Berchedene, 1: 2s. 8d.
Alfledauuicha, 1: 2s.
Brachinges, 1: 12d.
Theisescote, 1: 10s.
Westmele, 3: 21s. 8d.
Do. 1: 10s.
Peritone, 4: 73s. 4d.
Emmewelle, 1: 6s.
Hertfordingberie, 2: 6s.
Stanestede, 1: 10s.
Waras, 2: 23s., 400 eels, less 25.
Do. 3: 10s. Here in the lord's demesne are two mills of 400 eels, less 25. Other men have three mills rendering per an. 10s
Do. 2: 23s., 400 eels, less 25.
Do. 3: 10s.
Belingehou, 1: 6s. 8d.
Westone, 1: 10s.
Chenepeworde, 1: 12s.
Hertford Hd., 1: 6s.8d.
Gatesdene, 1: 5s.
Bissei, 2: 8s.
Dichelesuuelle, 1½: 8s. 8d.
Belingehou, 1: 10s.
Sabrixteworde, 1: 20s.
Torlei, 1: 10s.
Welge, 1: 8s.
Hegestanestone, 1: 40d.
Sela, 1: 2s.
Rochesforde, 1: 5s.
Esteuuiche, 1: 5s.
Dichelesuuelle, ½: 40d.
Senechape, 1: 20s.
Esceuuelle, 1: 10s.
Radeuuelle, 1: 6s.8d.
Tenuinge, 1: 8s.
Wodtone, 1: 13s. 4d.
Standone, 5: 45s.
Broches, 1: 8s.
Hodesdone, 1: 10s.
Thepecmape, 1: 12d.

BOCHINGHASCIRE. (I. 143.)

Bochingheham, 1 : 14s.
Do. 1 : 10s.
Eilesberia, 2 : 23s.
Wendovre, 2 : 10s.
Riseberge, 2 : 14s. 8d.
Opetone, 1 : 4s.
Brvnhelle, 1 : 10s.
Bechesdene, 2 : 28d.
Nedreham, 2 : 20s.
Haltone, 1 : 15s.
Wicvmbe, 3 : 20s.
Stoches, 1 : 10s.
Waborne, 8 : 104s.
Lede, 3 : 14s.
Danitone, 1 : 4s.
Herdeuuelle, 1 : 8s.
Westone, 4 : 33s. 4d.
Celfunde, 1 : 6s.
Elmodesham, 1 : 4s.
Cestreham, 2 : 3s.
Dileherst, 1 : 3s.
Berlave, 1 : 20s.
Santesdone, 1.
Imere, 1 : 10s.
Prestone, 1 : 32d.
Ceteode, 1 : 30d.
Tedinwiche, 1 : 4s.
Gateherst, 1 : 13s.
Sevinestone, 1 : 10s.
Etone, 1 : 20s.
Linforde, 1 : 8s. 8d.
Olenei, 1 : 40s., 200 eels.
Lauuendene, 1½ : 27s., 250 eels.
Clystone, 1.
Serintone, 1 : 26s.
Daneham, 2 : 7s.
Horsedene, 1: rendering nothing.
Bledelai, 1 : 24 sumas of malt.
Caldecote, 1 : 5 oras and 4 pence.
Lauuendene, 1 : 10s., 50 eels.
Brichella, 2 : 30s.
Credendone, 1 : 18s.
Wichendone, 1 : 20s., 70 eels.
Lechamestede, 1 : 20d.
Becentone, 1 : 10s.
Vlesdone, 1 : 4s.
Vlsiestone, 1 : 10s.
Vlsiestone, 1 : 6s. 4d.
Ravenston, 1 : 25s.
Brotone, 1 : of the Hall.
Brichelle, 1 : 10s.
Brotone, 1 : 10s.
Havresham, 1 : 8s., 75 eels.
Stoches, 1 : 4s.
Soleberie, 1 : 16s.
Nevport, 2 : 40s.
Caldecote, 1 : 8s.
Moselie Hd., 1 : 20s.
Evreham, 3 : 44s.
Wicvbe, 6 : 75s.
Missevorde, 3 : 15s.
Stradford, 1 : 8s.
Wirecasberie, 2 : 40s.
Eddinberge, 2 : 15s. 4d.
Santesdune, 2 : 8s.
Sobintone, 1 : 10s.
Votesdone, 1 : 12s.
Stantone, 1 : 10s. 8d., 50 eels.
Estone, 1 : 5 silver oras.
Linceladam, 1 : 20s.
Elmodesham, 1 : 5s.
Cestreham, 1 : 10s.
Calvretone, 1 : 13s. 4d.
Hortvne, 1 : 20s.
Ettone, 2 : 20s.
Tvrvestone, 1 : 7s. 6d.
Chenebelle, 1 : 16s.
Ferneham, 1 : Radulf Tailgebose is making here upon the land of Bertram [B. de Verduno holding the berewic of Ferneham] a mill which was not here [the site of which was not here] in the time of King Edward, as is proved by the Hundred.
Westberie, 2 : 18s.
Radeclive, 1 : 5s.
Ternitone, 1 : 10 oras.
Celsunte, 3 : One rendering 5 oras and the other two rendering nothing.
Torneberge, 1 : 20s.
Pateberie, 1 : 15s.
Stoches, 1 : 8s.

IX. DOMESDAY MILLS.

23. Schedule.

Bochinghascire—*contd.*

Wluerintone, 2 : 32s. 8d.
Elmodesham, 1 : 4s.
Soleberie, 1 : 16s.
Hamescle, 1 : 12s.
Merlave, 1 : 20s.

Bochinghascire—*contd.*

Hanbledene, 1 : 20s.
Cestreham, 1 : 6s. 8d.
Mortone, 1 : 10s.
Cliftone, ½ : 11s.
Middeltone, 1 : 6s. 8d.

OXENEFORDSCIRE. (I. 154.)

Oxenford.
Besintone, 2 : 40s.
Hedintone, 2 : 50s.
Cherielintone, 2 : 35s.
Optone, 2 : 10s. 4d.
Sciptone, 6 : 55s.
Bentone, 4 : 25s.
Blochesham, 6 : 56s. 4d.
Langefort, 2 : 20s.
Witenie, 2 : 32s. 6d.
Edbvrgberie, 2 : 30s.
Dorchecestre, 1 : 20s.
Do. 4 : 38s.
Tame, 1 : 20s.
Middeltone, 1 : 15s.
Banesberie, 3 : 45s.
Cropelie, 2 : 28s.
Eglesham, 1 : 12s., 450 eels.
Mideltone, 1 : 8s.
Banesberie, 1 : 5s. 4d. Robt and Walchet hold certain land here and the mill belongs to one of them.
Cropelei, 3 : 35s. 4d.
Wicham, 1 : 30s.
Stoch, 1 : 9s. 5d.
Cvbe, 1 : 3s.
Dadintone, 3 : 41s., 100 eels.
Stantone, 3 : 40s.
Britewelle, 1 : 20d.
Svmertvne, 1 : 20s., 400 eels.
Feringeford, 2 : 10s.
Blade, 2 : 14s., 125 eels.
Coges, 1 : 10s.
Cersetone, 1 : 15s. 6d., 75 eels (with fishery). [The same statistics appear in a duplicate entry under "Chersetone."]
Bvreford, 2 : 25s.
Niwetone, ½ : 16d.
Niwetone, ½ : 25d.
Do. ½ : 16d.
Bertone, 1 : 2s.
Do. 2 : 10s.
Hortone, 2 : 6s. 8d.
Sanford, 1 : 30d.
Cestitone, 1 : 50d.
Lineham, 1 : 7s. 6d.
Levachanole, 1 : 20d.
Codesdone, 1.
Bereford, 1 : 9s.
Tademertone, 1 : 4s.
Do. 1 : 5s.
Henestan, 4 : 19s.
Teigtone, 2 : 32s. 6d.
Westone, 1 : 4s.
Peritone, 1 : 5s.
Tachelie, 1 : 10s.
Cercelle, 2 : 20s.
Hornelie, part : 16d.
Midelcvbe, part : 2s.
Minstre, 2 : 20s.
Covelie, 1 : 35s., (including the rent of one virgate of land).
Cavesham, 1 : 20s.
Lachebroc, site : 10s.
Cravmares, 2 : 40s.
Hentone, 1 : 12s.
Hvnesworde, 1 : 8s.
Malpedreham, 1 : 20s.
Celford, 1 : 3s. 4d.
Dene, 2 : 5s.
Hornelie, 1 : 5s.
Watelintone. 2 : 10s. 8d.
Garinges, 1 : 20s.
Bernecestre, 2 : 40s.
Chadelintone, 1 : 30s.
Etone, 1 : 15s.
Hochenartone, 2 : 20s.
Draitone, 1 : 10s.
Oxenford, 1 : 10s.

Oxenefordscire—*contd.*

Haiforde, 1 : 12s.
Westone, 2 : 4s.
Fvelewell, 1 : 10s.
Dochelintone, 1 : 12s.
Rowesham, parts of 2 : 11s. 6d.
Esthcole, 1 : 5s.
Misseberie, 2 : 9s. 4d.
Esthale, 2 : 22s.
Fvlebroc, 1 : 10s.
Lege, 1 : 12s. 8d.
Wistelle, 1 : 8s.
Trop, 1 : 6s., 125 eels.
Nevham, 1 : 20s.
Secendene, 3 : 12s.
Godendone, 1 : 3s.
Brohtvne, 2 : 16s.
Hornelie, part : 16d.
Gadintone, 1 : 11s.
Cote, 1 : 2s.
Celgrave, 5 : 60s.
Redrefeld, 1 : 20s.
Witecerce, 1 : 20s.
Stoches, 2 : 20s.
Cestretone, 1 : 10s.
Hegford, 1 : 10s.
Advelle, 1 : 6s.
Cvchesa, 3 : 18s.
Werochestan, 1 : 8s.
Haneberge, 1 : 10s.
Caningeham, 1 : 44d.

Oxenefordscire—*contd.*

Bortone, 1 : 4s.
Nortone, 3 : 62d.
Estone, 1 : 30s., with fishery.
Terra Willi Levric, part : 40d.
Brotone, 2 : 12s. 6d.
Bradewelle, 2 : 20s., with land and fishery.
Letelape, 1 : 20s.
Edrope, 1 : 5s.
Chidintone, 1 : 5s.
Draitone, 1 : 4s.
Hantone, 1 : 15s.
Covelie, 1 : 40s.
Blicestone, 1 : 7s. 6d.
Minstre, 1 : 10s.
Do. 2 : 40s. Sauuold holds here of the king two mills, near the Holy Wall, which the king granted him with his wife.
Hansitone, 1 : 5s.
Midelcvbe, part : 2s.
Bvrtone, 1 : 3s
Radeford, 1 : 20d.
Chidintone, part : 20d.
Nevtone, 1 : 25d.
Svrford, 1 : 6s.
Mongewel, 2 : 45s.
Bristelmestone, 1 : 11s.
Cornewelle, 1 : 2s.
Salford, part : 12d.

GLOWCESTSCIRE. (I. 162.)

Caldecote, 1 : 10s.
Strigoielg, 2 : 10s. Roger de Laci holds in fee at Strigoielg as much residential land with one mill as is worth 36s.
Huscham, 1 : 7s.
Do. 1 : 15s.
Chinteneham, 2 : 11s. 8d.
Bertvne, 1 : 4s.
Do. 2.
Cirecestre, 3 : 30s.
Bertvne, 1.
Sclostre, 2 : 1 silver mark.
Langeberge, 1 : 5s.
Avre, 1 : 30d.

Birchelai (with berewicks), 2 : 12s.
Do. do., 8 : 57s. 6d.
Neueton, 1 : 5s.
Bertvne apud Bristov, 2 : 27s.
Bradelei, 2 : 20s.
Teodechesberie, 2 : 20s.
Do. 1 : 16d.
Senendone, 1 : 3s.
Clifort, 1 : 12s.
Chenemertone, 3 : 15s.
Botintone, 1 : 8s.
Tvrneberie, 2 : 6s. 4d. in the time of King Edward : now the rent is increased by 8d.

IX. DOMESDAY MILLS.

23. Schedule.

Glowcestscire—*contd.*

Sopeberie, 1 : 5s., now increased by 40d.
Aveninge, 4 : 19s., one of these is now increased by 40d.
Fareforde, 3 : 32s. 6d.
Lindenee, 1 : 40d.
Tedeneha, 1 : 40d.
Cedeforde, 3 : 14s. 2d.
Chenvichelle, 2 : 20s.
Tochintvne, 1 : 8d.
Bernitone, 1 : 5s.
Hochilicote, 1 : 32d.
Nortvne, 1 : 32d.
Lecce, 2 : 7s. 4d.
Stanuuelle, 1 : 40d.
Cvntvne, 1 : 5s.
Widiforde, 1 : 10s.
Cernei, 1 : 7s.
Hvesberie, 1 : 20d.
Colesborne, 2 : 7s. 6d.
Aicote, 1 : 64d.
Becheberie, 2 : 17s.
Contone, 1 : 5s.
Fuscote & members, 3 : 13s. 4d.
Surham, 1 : 12d.
Actvne, ½ : 16d.
Didintone, 2 : 10s. 10d.
Escetone, 1 : 50d.
Pvlcrecerce, 2 : 100d.
Bertvne, 1 : 5s.
Boxewelle, 1 : 5s.
Cvlne, 2 : 25s.
Ledene, 1 : 4s.
Omenie, 1 : 5s.
Dvntesborne, 1 : 2s.
Do. 1 : 12s.
Scirebvrne, 4 : 40s.
Bladintvn, 1 : 5s.
Cerletone, 1 : 20d.
Wenrie, 1½ : 12s. 6d.
Malgeresberie, 1 : 8s.
Svvelle, 3 : 20s.
Dvbentone, 1 : 6s.
Kvlege, 1 : 50d.
Havochesberie, 3 : 19s. 2d.
Noent, 1 : 20d.
Do. 2 : 6s. 8d.
Beraw, &c., 4 : 20s.
Penne, 1 : 40d.

Glowcestscire—*contd.*

Stantone, 8 : 45s.
Horselei, 1 : 50d.
Biselege, 5 : 16s.
Capedene, 2 : 6s. 2d.
Omenie, 2 : 10s.
Drifelle, 1 : 5s.
Stanhos, 2 : 17s. 6d.
Odelaveston, 1 : 40d.
Dvntesborne, 1 : 8s.
Beieuurde, 1 : 12d.
Hope, 1 : 17d.
Ledenei, 1 : 5s.
Bristentone, 2 : 15s.
Getinge, 2 : 14s.
Cateslat, 1 : 5s.
Bernintone, 1 : 40d.
Duham, 3 : 15s.
Hochinton, &c., 4 : 40s.
Litentone, 1 : 4s.
Heile, 1 : 10s.
Witetvne, 1 : 10s.
Risedone, 1 : 10s.
Getinge, 3 : 24s.
Wiche, 4 : 24s.
Egesworde, 1 : 30d.
Qvenintone, 2 : 20s.
Wenric, 1 : 5s.
Do. 1 : 3s.
Stratone, 2 : 20s.
Svintone, 1 : 10s.
Sclostre, 1 : 12s.
Wermetvn, 1 : 8s.
Teteberie, 1 : 15d.
Hasedene, ½ : 30d.
Omenie, 1 : 5s.
Svelle, 1 : 7s. 6d.
Risendone, 1 : 10s.
Horedone, 1 : 6s.
Sapletorne and Frantone, 2 : 6s.
Wicvene, 2 : 10s.
Risendvne, 2 : 20s.
Brimesfelde, 2 : 64d.
Cernei, 1 : 8s.
Rindecome, 1 : 8s.
Rindecvbe, 1 : 5s.
Hvrford, 1 : 5s.
Frantone, 1 : 10s.
Lece, 1 : 10s.
Bermintone, 1 : 10s.

Glowcestscire—*contd.*

Blideslav, 1 : 19s.
Frantone, 2 : 5s.
Lecelade, 3 : 30s.
Chenemeresforde, 4 : 40s. 40d.
Etherope, 1 : 15s.
Svdlege, 6 : 52s.
Todintvn, 2 : 20s.
Westone, 1 : 10s.
Brocowardinge, 1 : 2s.
Sciptvne, 1 : 10s.
Benewedene, 1 : 10s.
Cerintone, 1 : 30d.
Alrelie, 1 : 10s.
Svineberie, 1 : 6d.
Estvne, 1 : 8s.
Hildeslie, 3 : 18s.
Torteword, 3 : 15s.
Stantone, 2 : 35s.
Winestane, 1 : 20d.

Glowcestscire—*contd.*

Poteslepe, 2 : 15s.
Winestvne, 1 : 7s. 6d.
Colesburne, 1 : 50d.
Pantelie, 1 : 7s. 6d.
Omenie, 1 : 5s.
Svdintone, 1 : 5s.
Actvne, 1½ : 64d.
Tenevrde, 1 : 11d.
Scipetone, 1 : 10s.
Do. 1 : 12s.
Cervelde, 1 : 10s.
Wenric, 1½ : 12s. 6d.
Niwetone, 1 : 5s.
Pignocsire, 1 : 30d.
Widecestre, 1 : 10s.
Witenhert, 1 : 10s.
Alcrintone, 1 : 10s.
Rvdeford, 1 : rendering in wheat what it can earn.

WIRCESTRESCIRE. (I. 172.)

Bremesgrave, 3 : 13s. 4d.
Chideminstre, 1 : 5 oras.
Do. 2 : 16s.
Chemesege, 1 : 40d.
Wiche, 2 : 12s.
Codrie, 1 : 5s.
Fledebirie, 1 : 10s., 20 sticks of eels.
Biscopesleng, 1 : 4s.
Bisantvne, 1 : 12d.
Breodvn, 1 : 6s. 8d.
Ridmerlege, 1 : 5s. 8d.
Rippel, 1.
Evnilade, 1 : 32d.
Tredinctvn, 3 : 32s. 6d.
Aichintvne, 1 : 10s.
Longedvne, 1 : 2s.
Do. 1 : 8s.
Norwiche, 3 : 50s.
Hvdintvne, 1 : 3 sumas of grain.
Circehille, 1 : 3s.
Seccgesvarve, 2 : 10s.
Scepwestvn, 1 : 10s.
Herferthvn cum Wibvrgestoke, 1 : 10s.
Grinanleh, 1 : sine censū.
Halhegan cum Bradewesham, 1 : 10s.
Cropetorn cum Neotheretvne, 1 : 20s., 20 sticks of eels.
Clive cum Lanc, 1 : 6 sextars of meal.
Crohlea, 1 : 2s.
Stoche Estone and Bedindone, 2 : 7 oras.
Stverteberie, 2 : 4s., 10 sumas of grain.
Vlwartelei, 1 : 6s.
Ardolvestone and Cnistetone, 1 : 10s.
Persore, 3 : 50s.
Poiwic, 1 : serving the Hall.
Do. 1 : 16d.
Cvbrintvne, 1 : 30 sumas of grain.
Persore, 1 : 4s.
Do. 1 : 10s.
Pidele, ½ : 10s., 20 sticks of eels.
Stvre, 2 : 17s. 6d.
Lege, 2 : 10s. 9d.
Do. 1 : 4s.
Bradnesforde, 1 : 20s.
Matma, 1 : 30d.
Evesham, 1 : 30s.
Nortvne, 2 : 22s. 6d., 2000 eels.
Bratfordone, 1 : 12s. 6d.

IX. DOMESDAY MILLS.

23. Schedule.

Wircestrescire—*contd.*

Aldintone, 1 : 5s.
Bratfordvne, 1 : 40d.
Ambreslege, 2 ; 8s.
Hantvn, 2 : 20s.
Salewarpe, 1 : 10s.
Betvne, 1 : 5s.
Eslei, 2 : 10s.
Wirecest, 2 : 20s.
Estha and Bestewde, 1 : 6s. 8d.
Ælmeleia, 3 : 109s. 4d.
Stotvne, 1 : 20s.
Beritvne, 1 : 22 sumas of grain (miller mentioned among servants of the manor).
Chvre, 1 : 10 sumas of wheat.
Hame, 1 : 16 sumas of grain.

Wircestrescire—*contd.*

Sapie, 1 : 6 sumas of grain.
Wicelbold, 5 : £4, 8s.
Dodeham, 1 : 12s. (miller mentioned among servants of the manor).
Clese, 1 : 4s. 8d.
Svineforde, 1 : 5s.
Costone, 1 : serving the hall of one of the holders of land; there being two.
Stanes, 1 : 3 oras.
Lvnvredele, 1 : 4s.
Hatete, 1 : 2s.
Vptvne, 1 : 4s.
Hautvne, 1 : 30s.
Cedeslai, 3 : 12 sumas of grain.

HEREFORDSCIRE. (I. 179.)

Lintvne, 1 : 8d.
Lvcvordne, 1 : 10s.
Rueland, 2 : 15s.
Do. 1 : 7s.
Mavrdine, 1 : 20s., 24 sticks of eels.
Lene, 2 : 26s. 4d., 500 eels.
Do. 2 : 25s.
Merchelai, 1 : rendering nothing save the victuals of him who has charge of it.
Clive, 2 : 6s.
Stanford, 1 : 6s.
Leofminstre cum membris, 8 : 108s. : 100 sticks of eels. In the time of King Edward the eight mills paid 73s. and 30 sticks of eels.
Lege, 2 : 24s.
Riseberie, 1 : 4s.
Bradeford, 1 : 10s.
Stantone, 1 : 40d.
Merlie, 1 : 8s.
Feccheham, 1 : 2s. Miller mentioned among manorial servants.
Hanlie, 1 : 2s.
Edresfelle, 1 : 2s.
Svchelie, 1 : 6s., with the custody of the hives.
Castellus Monemvde, 3 : 20s.
Prestetvne, 1 : 2s.
Etvne, 1 : 5s.
Capel, 1 : 3s.
Widingtvne, 1 : 2s.
Frome, 1 : 8s.
Do. 1 : 32d.
Rosse, 1 : 6s. 8d.
Liedeberge, 1 : 32d.
Hasles, 1 : 2s.
Bageberge, 1 : 32d.
Do. 1 : 16d.
Boseberge, 1 : 30d.
Credelaie, 1 : 32d.
Colewelle, 1 : 16d.
Hantvne, 2½ : 35s.
Topeslage, 1 : 20s.
Scelwiche, 1 : 30s.
Pevne, 1 : 32d.
Mortvne, 1 : 4s.
Bromgerbe, 1 : 10s.
Lvtelonhereford, 1 : 6s. 8d.
Do. 4. Here are four mills, the half of which rightly belong to this manor.
Brvntvne, 1 : 8s.
Hinetvne, 1 : 4s.
Svtvne, 1 : 8s., 8 sticks of eels.
Do. 1 : 10s., 7 sticks of eels.

Herefordscire—*contd.*

Awenebvri, 1 : rendering nothing.
Cliford, 1 : 3 modias of grain.
Leine, 1 : 11s., 25 sticks of eels.
Dvnre, 1 : 28d. In the water no one can fish without license.
Stoches, 1 : 10s.
Lintehale, 1 : 30s.
Bodeham, 1 : 16s., 30 sticks of eels.
Boniniope, ⅓ of 2 : 14s. 8d.
Stratone, 1 : 32d.
Westvne, 1 : 10s.
Archel, 1 : 100d.
Nerefrvm, 1 : 7s. 6d., 5 sticks of eels.
Brismerfrvm, 1 : 10s.
Merchelai, rendering grain.
Frome, 1 : 10s. 10d.
Letvne, 1 : rendering nothing.
Bviford, 1 : 20s.
Stoches, 1 : 5s.

Herefordscire—*contd.*

Frome, 1 : 32d.
Bvtrelie, 1 : 16d.
Avretone, 1 : 4 modias of grain and 15 sticks of eels.
Stratvne, 2 : 6s. 8d.
Alwintvne, 1 : 40d.
Ledene, 1 : 32d.
Bvrgelle, 1 : 20s., 5 sticks of eels.
Torneleus Hd., 1 : 5s.
Penebrvge, 1 : 10s.
Estvne, 1 : rendering nothing.
Hope, 1 : 5s.
Boninhope, ⅓ of 2 : 14s. 8d.
Clevnge, 1 : 5s.
Rvvenore, 1 : 2s.
Lvdeforde, 1 : 6s.
Boninhope, ⅓ : 13s. 8d.
Chetestor, 1 : 4s.
Chenecestre, 1 : 2s.
Wilmestvne, 1 : 3s.
Walintone, 2 : 13s.

GRENTEBRSCIRE. (I. 189.)

Bvrgvm de Grentebrige, 3 : £9 ; built by Picot.
Witborham, 1 : 10s., and 2 oras in toll.
Saham, 2 : 24s.
Fordeham, 3½ : 22s. 8d., 1250 eels.
Esselinge, 3 : 20s., 7000 eels.
Walchelin, 1 : 16d.
Do. 2 : 32d.
Basingborne, 2 : 20s.
Histetone, 1 : 8s.
Gisleham, ½ : 2s. 8d., 300 eels.
Belesham, 1 : 4s.
Coeia, ½ : 40d. Held by Picot under the abbot.
Horningesie, 1 : 10s., 1000 eels.
Pampesuuorde, 1 : 10s.
Havochestvn, 2 : 50s.
Escelforde, 2 : 45s.
Melrede, 1 : 3s.
Melleburne, 1 : 2s. 8d.
Bvrewelle, 2 : 6s. 8d.
Foxetvne, ½ : 10s. 8d.
Barentone, 1 : 25s. 4d.
Esceprid, 1 : 5s. 4d.
Salseton, 1 : 26s. 2d.
Scelgei, 1 : 10s.
Melrode, 2 : 15s. 4d.
Fuleberie, 1 : 20s.
Hintone, 4 : 25s.
Bercheham, 1 : 5s.
Do. 1 : 2s.
Morin, 1 : 2s.
Lintone, 2 : 16s.
Alia Lintone, 1 : 8s.
Abintone, 1 : 6s. 8d.
Badburgh, 1 : 5s. 4d.
Wandric, 2 : 45s.
Basingborne, 2 : 20s.
Wadune, 1 : 12d.
Melrede, 2 : 18s.
Grantesete, 2 : 100s.
Escepride, 1 : 14d.
Svaveste, 1 : 40s.
Suasam, 1 : 4s. 4d., 100 eels.
Do. 1 : 5s. 4d.
Do. 1 : 18s.
Bellingeham, 2 : one rendering 7s. 6d., and the other the grinding for the lord.

IX. DOMESDAY MILLS.

23. Schedule.

Grentebrȝscire—*contd.*

Essellinge, 1 : 5s. 4d.
Burnuelle, 2 : 6s. 8d.
Wicham, 3 : 28s., 4250 eels.
Hichelintone, 2 : 30s.
Dochesuuorde, 1 : which paid 12s., and is now broken, but can be repaired.
Do. 1 : farmed out.
Grantesete, 1 : 40s.
Bodichessha, 4 : 14s.
Suafha, 3 : 30s. 4½d., and 300 eels.
Do. 1. In the time of King Edward, Alurin, harparius, held this manor and one mill, which he farmed from the monks of Ely. He had them in the lifetime and at the day of the death of the king, and was not able to recede without license from the abbot.
Herletone, ½ : 13s. 4d., 100 eels.
Trumpinton, 1 : 20s.
Chenet, 1 : rendering nothing.
Dochesuuorde, 2 : 50s.
Fuglemære, 1 : 10s. 8d.
Barentone, 1½ : 32s.
Orduuelle, 1 : 12s.
Salsitone, 1 : 26s. 8d.

Grentebrȝscire—*contd.*

Foxetune, ½ : 10s. 8d., which Robert Gernon occupied above Goisfred, as the men of the Hundred state.
Esceprid, 2 : 10s. 8d.
Salsitone, 2 : 30s. 8d.
Hanochestone, 1 : 20s.
Mordune, 2 : 2 oras.
Melrede, 1 : 5s. 4d.
Esceprid, 1 : 7s. 2¼d.
Orduuelle, 1 : 8s.
Snellewelle, 4 : 14s. 4d.
Suafham, 1 : 7s.
Wiborgham, 1 : 22s.
Hildricesham, 1 : 10s.
Abintone, 1 : 9s.
Melrede, 2 : 10s. 8d.
Do. ⅓ : 2s. 8d.
Coeia, 2½ : 22s. Held by Picot.
Do. ½ : 11d.
Hestitone, 2 : 21s. 4d.
Herlestone, 1 : 30s.
Tadelai, 1 : 10s. Held by Picot.
Mordune, 1 : 4s.
Haslingefeldam, 1 : 2s.
Lolesuuorde, 1 : rendering nothing.
Grantesete, 1 : 40s.
Witelesforde, 3 : 60s.

HVNTEDVNSCIRE. (I. 203.)

Hvntedvn Burg, 1 : rendering the king 40s. and the earl 20s.
Hereforde, 2 : £4.
Brantvne, 2 : 100s.
Godmvndcestre, 3 : 100s.
Bvgedene, 1 : 30s.
Lactone, 1 : 3s.
Spaldvice, 1 : 2s.
Broctvne, 1 : 3s.
Wistov, 1 : 2s.
Hoctvne, 1 : 20s.
Witvne, 1 : 12s.
Adelintvne, 2 : 40s.
Emingeforde, 1 : 10s. 8d.
Newetone, 2 : 32s.
Sibestvne, ½ : 10s.
Alwoltvne, 2 : 40s.
Sibestvne, ½ : 10s.
Opetvne, 1 : 3s.
Chenebaltone, 1 : 5s.
Upeforde, 2 : 50s.
Cateworde, 1 : 2s.
Emvlvesberie, 2 : 32s.
Pachestone, 3 : 64s.
Emingeforde, 2 : £6.
Einvlvesberie, 1 : 23s.

BEDEFORDSCIRE. (I. 209.)

Lestone, 2 : 30s.
Loitune, 6 : 100s.
Do. 1 : 10s.
Eseltone, 1 : 3s.
Tornai, 1 : 20s.
Buchelai, 1 : 25s.
Bichelefuuorde, 2 : 40s., 120 eels.
Alricesei, 2 : 26s. 8d.
Chenemondewicke, 1 : 12s. 4d.
Wichestanestow, 1 : 20s.
Bertone, 1 : 2s.
Pechesdone, 2 : 27s. 8d.
Bereforde, 1 : 12s., 125 eels.
Sethlindone, 1 : broken, and rendering nothing.
Hohewella, 2 : 20s.
Pabeneham, 1 : 20s.
Cudessane, 1 mill can be built here.
Chabeltone, 1 : 3s. 3d.
Alriceseie, 1 : 10s.
Clopeham, 1 : 40s.
Etone, 2 : 36s. 6d., 100 eels.
Tamiseforde, 1 : 10s.
Do. 1 : 12s.
Sandeia, 2 : 50s.
Stanford, 2 : 29s., 50 eels.
Bistone, 1 : 20s.
Nortgine, 1 : 14s.
Clistone, 2 : 40s., 150 eels.
Chaisot, 1 : 2s.
Pvtenehov, 1 : 30s., 100 eels.
Chainhalle, 1 : 40s., 100 eels.
Goldentone, 1 : 30s., 100 eels.
Chernetone, 1 : 40s., 100 eels.
Welitone, 1 : 12s., 100 eels.
Stotfalt, 4 : £4, 400 eels.
Aspeleia, 1 : 10s.
Saleford, 1 : 9s. 4d.
Blecheshon, ½ : 10s.
Brvneham, 1 : 20s., 125 eels.
Bereforde. 1 : 22s., 80 eels.
Bereforde, 1 : 7s.
Estuuiche, 1 : 9s. 4d.
Stanforde, ½ : 5s.
Melebroc, 2 : 6s.
Chainehon, 1 : 6s.
Carlewtone, 1 : 13s.
Hanestan, 1 : 5s.
Radeuuelle, 1 : 10s.
Holecote, 1 : 5s. 4d.
Bideham, 1 : 10s.
Chanelestorne. 1 : 13s. 4d.
Rochesdone, 1 : 33s., 260 eels.
Aisseuuorde, 1 : 8s.
Stanford, ½ : 5s.
Wardone, 1 : 12s.
Nortginele, ½ : 13s.
Achelei, 1 : 26s., 200 eels.
Totenehov, 3 : 10s. 8d.
Wadehelle, 1 : 36s. 8d., 200 eels.
Estuuiche, 1 : 13s.
Langeforde, 2 : 26s. 8d.
Hanstane, 1 : 34s.
Sewillessov, 1 : 26d.
Totenehou, 1 : 3s.
Cranelai, 2 : 10s.
Flicteuuiche, 1 : 4s.
Sernebroc, 1 : 16s.
Pichelesuuade, 2 : 47s.
Gledelai, 1 : 16s.
Meldone, 1 : 3s.
Elnestov, 1 : 24s.
Camestone, 1 : 5s.
Blacheshon, ½ : 10s.
Brumeham, 1 : 40s., 100 eels.
Falmeresham, 1 : 10s.
Hareuuelle, 1 : 36s. 8d., 200 eels.
Potone, 1 : 5s.
Cerlentone, 1 : 30s.
Mildentone, 1 : 20s.
Hatelai, 1 : 18s.
Stauford, 1 : 13s. 4d.
Chichesana, 1 : 10s.

IX. DOMESDAY MILLS.

NORTHANTSCIRE. (I. 219.)

23. Schedule.

Chetene, 1 : 6s. 8d.
Tichesovre, 1 : 5s.
Seietone, 1 : 36d.
Lvfenham, 1 : 36d.
Do. and Scvletorp, 2 : 40d.
Castretone, 1 : 16s.
Nortone, 2 : 15s.
Tovecestre, 1 : 13s. 4d.
Svdtone, 1 : 10s. 8d.
Hardingestorp, 2 : 50s.
Gretone, 1 : 3s.
Brigstoc, 1 : 5s.
Dodintone, 1 : 4s.
Rodewell and Overtone, 2 : 9s. 4d.
Briclesworde, 2 : 33s. 4d.
Torp, 3 : 43s. 4d.
Optone, 1 : 12s. 8d.
Nassintone, 2 : 30s. 8d.
Bereford, 1 : 32d.
Patorp, 1 : 6s.
Tanesovre, 1 : 10s.
Clive, 1 : 12d.
Bassonha, 1 : 13s. 4d.
Wiclei, 1 : 64d.
Tingdene, 2 : 18s.
Do. 1 : 16s.
Halecote, 1 : 8d.
Hohtone, 1 : 8d.
Waltone, 1 : 4s.
Hertewelle, 1 : 17s. 4d.
Horne, 3 : 20s.
Rande, 1 33s. 8d.
Do. 1 : 12d.
Deneforde, 2 : 50s. 8d., and 300 eels.
Wadenho, 1 : 12d.
Do. 1 : 13s. 4d., and 65 eels.
Hargindone, 1 : 8s.
Hocecote, 1 : 10s.
Tingdene, 1 : 5s.
Bertone, 2 : 10s.
Edintone, 1 : 16d.
Stanere, 1 : 32d.
Lvhwic, 1 : 64d.
Finemere, 1 : 14s.
Glintone, 1 : 5s.
Egforde, 1 : 20s.
Stoche, 2 : 8s.
Esindone. 1 : 16s.
Ceevecvbe, 3 : 16s.
Bvrg, 1 : 5s.
Cotingeha, 1 : 40d.
Castre, 1 : 8s.
Eglesworde, 2 : 12s.
Pillesgate, 1 : 10s.
Vndelle, 1 : 20s., and 250 eels.
Wermintone, 1 : 40s., and 325 eels.
Ascetone, 2 : 40s., and 325 eels.
Tedinwelle, 2 : 24s.
Erdibvrne, 1 : 18s.
Stanwige, 1 : 20s.
Cateringe, 2 : 20s.
Witheringham, 3 : 19s.
Svdtorp, $2\frac{1}{2}$: 3s.
Glintone, 2 : 11s. 4d.
Pighteslea, 1 : 8s.
Wodeford, 1 : 2s.
Edintone, 1 : 12d., and 200 eels.
Erdinbvrne, 1 : 5s.
Craneford, 1 : 2s.
Dailintone, 1 : 20s.
Dene, 1 : 3s.
Svtbvrg, 1 : 6s.
Broctone, 1 : 12d.
Werchintone, 1 : 12s.
Bernewelle, 2 : 24s.
Wicetone and Dodintone, 1 : 20s.
Tviwella, 2 : 7s. 4d.
Wridtorp, 1 : 5s.
Edintone, 1 : 13s. 4d.
Wendleberie, 2 : 16s.
Badebi, 1 : 2s.
Nevbote, 1 : 2s.
Arintone, 4 : 2s.
Svtone, 1 : 32d.
Bvchebroc, 2 : 40s.
Eddone, 1 : 10s.
Brantone, 1 : 28s.
Elmedene, 1 : 12d.
Carlintone, 1 : 16d.
Bvgedone, 1 : 16d.
Pidesford, 1 : 2s.
Woltone, 1 : 40d.
Wedone, 1 : 40d.

Northantscire—*contd.*

Carveltone, 1 : 2s.
Herolvestvne, 1 : 2s.
Flora, 1 : 10s.
Dodeforde, 2 : 10s.
Estanestone, 1 : 10s.
Avelai, 1 : 12d.
Nortot, 1 : 8d.
Haiford, 1 : 16s.
Spretone, 1 : 6s.
Aldenestone, 1 : 8s.
Nortone, 1 : 10s.
Brachelai, 1 : 10s.
Wedone, 1 : 40d.
Welintone, 1 : 12d.
Svtone, 1 : 2s.
Wodeford, 1 : 8s.
Egedone, 1 : 2s.
Sciptvne, 1 : 11s.
Scipford, 1 : 32d.
Trapeford, 1 : 6s. 8d.
Merestone, 1s. 8s.
Perie, 1 : 18s. 4d.
Ticemerse, 1 : 21s. 4d.
Echentone, 2 : 14s.
Stoche, 1 : 12d.
Sewelle, 1 : 12d.
Ascele, 1 : 32d.
Teworde, 1 : 30d.
Blarewiche, 1 : 30d.
Ristone, ½ : 12d.
Moltone, 1 : 8d.
Westone, 1 : 20s.
Flora, 1 : 5s.
Hecham, 1 : 20s.
Risdene, 1 : 10s.
Cnutestone, 1 : 20s.
Irencestre, 1 : 16s.
Nevbote, 1 : 7s.
Dvstone, 1 : 20s.
Cortenhale, 1 : 12d.
Blidesworde, 1 : 2s.
Epingeha, 1½ : 12s.
Catesbi, 2 : 16d.
Deisbvrg, 1 : 2s.
Cota, 1 : 4s.
Pirie, 1 : 26s. 8d.
Bacvlveslea, 1 : 5s.
Toltorp, 4 : 40s.
Brandestone, 1 : 2s.

Northantscire—*contd.*

Cotesbroc, 1 : 12d.
Pitesford, 1 : 12d.
Hortone, 1 : 12d.
Evelai, 2 : 20s.
Do. 1 : 2s.
Pascelle, 2 : 32d.
Covesgrave, 1 : 13s.
Do. 1 : 8d.
Bvrtone, 2 : 16s.
Do. 2 : 26s.
Hargedone, 1 : 8s.
Isham, 1 : 10s.
Aldevincle, 1 : 6s.
Cvgenho, 1 : 13s.
Wacherlei, 1 : 5s.
Estone, 1 : 20s.
Wedone, 1 : 2s.
Wapeha, 1 : 4s.
Stane, 1 : 2s.
Brune, 1 : 32d.
Estwelle, 1 : 12d.
Mideltone, 1 : 30d.
Aienho, 1 : 10s.
Cliwetone, 1 : 2s.
Hintone, 1 : 2s.
Flora, part : 5s.
Hintone, 1 : 2s.
Cvleorde, 1 : 40d.
Ceselingeberie, 2 : 40s.
Stowe, 1 : 64d.
Epingeha, 5 : 42s. 8d.
Do. 5 : 24s.
Wicford, 2 : 15s.
Belinge, 1 : 2s.
Wilavestone, 1 : 5s.
Torp, 1 : 32s.
Grimberie, 1 : 10s.
Cnutestone, 1 : 8d.
Adestanestone, part : 4s.
Stoche, 1 : 13s. 4d.
Trapestone, 1 : 20s.
Taneford, part : 30d.
Isham, 1 : 10s.
Niwetone, 1 : 64d.
Riehale, 2 : 36s.
Belmestorp, 1 : 10s. 8d.
Fodringeia, 1 : 8s.
Haringeworde, 1 : 5s.
Bartone, 3 : 28s. 8d.

IX. DOMESDAY MILLS.

23. Schedule.

Northantscire—*contd.*

Grendone, 3 : 3s.
Wedlingeberie, 1 : 5s.
Tichecote, 1 : 24s.
Horne, 1 : 4s. 8d.
Newetone, ½ : 16d.
Do. 1 : 7s. 8d.
Asebi, 1 : 6s. 8d.
Risetone, 1 : 32d.
Lilleforde, 1 : 24s.

Northantscire—*contd.*

Sprotone, 1 : 64d.
Wilavestone, 1 : 6s. 8d.
Hohtone, 1 : 13s.
Bellinge, 1 : 20s.
Watford, 1 : 12d.
Castretone, 1 : 12s.
Stabintone, 1 : 8s.
Abimtone, 1 : 20s.
Ferendone, 1 : 12d.

LEDECESTRESCIRE. (I. 230.)

Ledcestre, ½ : 5s. 4d.
Cuipetone, 6 : 13s. 4d.
Rodolei, 1 : 4s.
Sciftitone, 1 : 12d.
Caldeuuelle, 2 : 2s.
Offerderbei, part.
Setintone, 1 : 2s.
Dislea, 2 : 5s.
Sepeshefde, 1 : 5s.
Walecote, 1 : 10d.
Halleach, 1 : 5s. 4d.
Ledecestre, 1½ : 10s. 8d.
Crochestone, 1 : 12d.
Branestone, 2 : 8s.
Pachintone, 1 : 12d.
Ailestone, 4 : 48s.
Hvnecote, 1 : 10s.
Crebre, 1 : 4s.
Svinford, 1 : 4s.
Tevlingorde, 1 : 2s.
Torp, 1 : 2s.
Anelepe, 1 : 8s.
Dvnitone, 1 : 10s. 8d.
Sceltone, 1 : 16d.
Rotebie, 1 : 28d.
Tvrchitelestone, 1 : 3s.
Merdegrave, 1 : 12s.
Bvrstelle, 1 : 10s.
Tvrmodestone, 1 : 6s. 8d.
Brvnestanestorp, 1 : 20s.
Petlinge, 1 : 16d.
Sapecote, 1 : 3s.
Creg, 1 : 3s.
Brostone, 1 : 2s.
Endrebie, 1 : 5s.
Clanefelde, 1 : 16d.
Scepehe, 1 : 10s.

Cotesbege, 1 : 3s.
Avintone, 1 : 2s.
Gerberie, 1 : 4s.
Galbi, 1 : 2s.
Stantone, 2 : 5s. 4d.
Langtone, 1 : 2s.
Glen, 1 : 3s.
Svtestone, 1 : 8s.
Bvrstele, 1 : 12d.
Siglebi, 2 : 30s.
Heletone, 1 : 2s.
Torp, 1 : 5s. 4d.
Stapeford, 2 : 8s.
Saxebi, 1 : 2s.
Castone, 1 : 10s.
Scepa, 1 : 2s.
Cvningestone, 1.
Scela, 1 : 5s.
Nevbold, 1 : 12d.
Botesford, 4 : 40s.
Gniptone, 1 : 5s.
Bothesford, 2½ : 5s. 6d.
Basvrde, 1 : 3s.
Nevtone, 1 : 2s.
Walendelia, 1 : 3s.
Reresbi, 1½ : 2s.
Lvdintone, 1 : 16d.
Radeclive, 1 : 3s.
Saltebi, 2 : 8s.
Wivordebie, 2 : 10s.
Wistanestov, 1 : 2s.
Nortone, 1 : 2s.
Do. 1 : 2s.
Tvrstanestone, 1 : 8s.
Sprotone, 1 : 4s.
Medeltone, 2 : 25s.
Vlestorp, 1 : 16d.

Ledecestrescire—*contd.*

Pichewelle, Lvvestorp, 1 : 4d.
Cvnibvrg, 1 : 10s.
Sprotone, 1 : 5s. 4d.
Minstretone, 1 : 2s.
Cilebi, 1 : 2s.
Ricoltorp, 1 : 4s.
Reresbi, 1 : 2s.
Alebi, part : 3s.
Glowesbi, 1 : 2s.
Adelachestone, 1 : 2s.
Ascbi, 1 : 4s.
Gadesbi, 1 : 12d.
Do. ½ : 2s.
Adelachestone, 1 : 16d.

Ledecestrescire—*contd.*

Saxebi, 1 : 4s.
Sprotone, 1 : 4s.
Petlinge, 1 : 16d.
Barchebi, 1 : 12d.
Barhov, 3 : 30s.
Brochesbi, 1 : 5s.
Frisebi, 1 : 28d.
Gadesbi, 1 : 3s.
Lvctebvrne, 2 ; 10s.
Tedingesworde, 1 : 6d.
Bladi, 1 : 2s.
Westham. 1 : 2s.
Sawelle, 1 : 2s.
Chivelesworde, 1 : 2s.

WARWICSCIRE. (I. 238.)

Brailes, 1 : 10s.
Bedeford, 3 : 43s. 4d.
Stanlei, 2 : 35s. 4d.
Coleshelle, 1 : 40d.
Cotes, 2 : 100s.
Caldecote, 1 : 2s.
Taschebroc, 2 : 12s. 8d.
Hantone, 1 : 6s. 8d.
Stradforde, 1 : 10s., and 1000 eels.
Alvestone, 3 : 40s., and 12 sticks of eels.
Spelesberie, 1 : 50d.
Arve, 1 : 6s. 8d.
Edricestone, 1 : 10s., and 10 sticks of eels.
Raneberge, 1 : 16d.
Svcha, 2 : 4s.
Sowa, 1 : 2s.
Hvnetone, 4 : 54s. 4d.
Wasmertone, 1 : 20s., 4 sumas of salt and 1000 eels.
Niwebold, 1 : 8s.
Alne, 1 : 5s.
Witelavesford, 1 : 10s., and 20 sticks of eels.
Salford, 1 : 10s., and 20 sticks of eels.
Chenevertone, 1 : 3s.
Lamintone, 2 : 24s.
Vlvricetone, 1 : 6s. 4d.
Leileforde, 1 : 10s. 6d.
Quatone, 1 : 2s.
Etone, 1 : 32d.
Cliptone, 2 ; 11s.
Chinesberie, 1 : 9s. 4d.
Coventrev, 1 : 3s. (Terra Comitissæ Godevæ).
Mvitone, 2 : 70s.
Malvertone, 1 : 50s.
Waltone, 1 : 6s.
Do. 2 : 12s.
Cerlecote, 2 : 21s.
Fvlebroc, 1 : 12s.
Prestitone, 1 : 16s.
Witecerce, 2 : 20s.
Cetitone, ½ : 5s.
Do. ½ : 5s.
Illintone, 1 : 6s. 8d.
Oveslei, 1 : 4s.
Rietone, 1 : 12s.
Patitone, 2 : 2s.
Dercelai, 1 : 32d.
Bertanestone, 1 : 4s.
Rocheberie, 1 : 13s. 4d.
Lilleford, 1 : 4s.
Asceshot, 2 : 20s.
Badechitone, 1 : 10s. 8d.
Bilnei, 1 : 40d.
Brandvne, 1 : 26d.
Redeford, 1 : 6s. 8d.
Moitone, 2 : 70s.
Bericote, 1 : 4s.
Coctvne, 1 : 32d.

IX. DOMESDAY MILLS.

23. Schedule.

Warwicscire—*contd.*

Mersetone, 2 : 11s.
Pilardetone, 1 : 5s.
Mideltone, 1 : 20s.
Octeselve, 1 : 16d.
Lodbroc, 1 : 3s.
Grendone, 1 : 5s.
Bortone, 2 : 7s. 8d.
Etendone, 1 : 18s.
Wara, 1 : 2s.
Volwarde, 1 : 20d.
Bvrdintone, 1 : 10s.
Offeworde, 1 : 4s.
Wotone, 2 : 11s., and 8 sticks of eels.
Bvbenhalle, 1 : 4s.
Dicforde, 1 : 68d.
Witeleia, 1 : 2s.
Merston, 1 : 10s.
Bertanestone, 1 : 4s.
Bvdebroc, 1 : 2s.
Estone, 1 : 3s.
Hardintone, 1 : 3s.
Berricestone, 1 : 100d.

Warwicscire—*contd.*

Beninton, part: rendering 4 sumas of grain and 8 sticks of eels.
Stodlei, 1 : 5s.
Spernore, 1 : 4s., and 7 sticks of eels.
Cvntone, 1 : 10s.
Lelleford, 1 : 14s.
Wapeberie, 1 : 6s. 8d.
Hantone, 1 : 40d.
Wara, 1 : 2s.
Vllavintone, 1 : 5s.
Benitone, 1 : 4s.
Do. 1 : 2s.
Estone, 1 : 8s., and 5 sticks of eels.
Bereford, 1 : 2s., and 13 sticks of eels.
Hildeberevrde, 1 : 12d.
Espelei, 1 : 16d.
Lvnintone, 1 : 2s.
Haselia, 1 : 4s.
Haselove, 1 : 6s. 8d.
Icentone, 2 : 6s. 8d.
Salford, 1 : 5s.
Herdeberge, 1 : 16d.

STATFORDSCIRE. (I. 246.)

Svinesford, 1 : 2s.
Wadnesberie, 1 : 2s.
Pancriz, 1 : 5s.
Rvwecestre, 1 : 10s.
Crachemers, 1 : 10s.
Bertone, 1 : 6s.
Rvgelie, 1 : 30d.
Mera, 1 : 3s., and 4000 eels.
Eleford, 2 : 20s.
Chenevare, 2 : 20s.
Clistone, 2 : 10s.
Draitone, 2 : 21s.
Opewas, 1 : 13s. 4d.
Horvlvestone, 1 : 4s.
Brevde, 2 : 4s.
Actone, 1 : 2s.
Haiwode, 1 : 5s.
Egleshelle, 2 : 4s.
Lecefelle, 2 : 4s.
Horeborne and Smedeuuich, 1.
Acovre, 1.
Rideware, 1 : 2s.
Statford Civitate, 1 : 4s.
Chenwardestone, 1 : 3s.
Geneshale, 1 : 12d.
Claverlege, 1 : 5s.
Nordlege, 1 : 2s.
Halas, 1 : 3s.
Mortone, 1 : 16d.
Cressvale, 1 : 5s.
Seneste, 1 : 66d.
Wrfeld, 3 : 40s.
Rolvestvne, 1 : 5s.
Bradelia, 1 : 5s.
Selte, 1 : 3s.
Stantone, 1 : 5s.
Coltvne, 1 : 12d.
Gestreon, part: 10d.
Titesovre, 1 : 8d.
Crotewiche, 1 : 4s.
Elachestone, 1 : 32d.
Celle, 1 : 12d.
Pecleshella, 1 : 12d.
Wicenore, 1 : 18d.
Rideware, 1 : 2s.
Cvdvlvestan Hd., 1 : 12d.

Statfordscire—*contd.*

Estretone, 1 : 4s.
Etone, 1 : 3s.
Penne, 1 : 2s.
Wambvrne, 2 : 4s.
Treslei, 1 : 4s.

Statfordscire—*contd.*

Rischale, 1 : 4d.
Pirio, 1 : 16d.
Honesworde, 1 : 2s.
Sibeford, 1 : 32d.
Nievetone, 1 : 4s.

IX. DOMESDAY MILLS.

23 Schedule.

SCIROPESCIRE. (I. 252.)

Beldewas, 1.
Lideberie, 1 : serving the Hall.
Sciropesberie. Earl Roger is building an abbey in Sciropesberie, and giving to the same the monastery of St. Peter (where was a parish of the city) with as many of his burgages and mills as will render £12 to the monks.
Wenloch, 2 : serving the monks.
Bvrtvne, 1 : serving the Court.
Linleshelle, 1 : but rendering nothing.
Langvedvne, 1 : 5s.
Recordine, 1 : 12s.
Conendovre, 1 : 8s. 6d.
Membrefelde, 1 : 10 sumas of grain.
Wititone, 1 : 5s.
Lidvn, 1 : rendering 1 pig (I. 253[b]).
Forde, 1 : 3 oras.
Ellesmeles, 1.*
Archelov, 2 : 12 sumas of grain.
Walitone, 1 : 12s.
Edmendvne, 1 : 10s., with a fishery.
Donitone, 1 : 5 sumas of grain.
Straton, 1.
Stodesdone, 1 : 10s.
Catinton, 1 : new mill.
Ardintone, 1 : 3 oras.
In Walis terrā de Gal, 1 : rendering nothing.
Marcemeslei, 1 : 5s.
Stantvne, 1 : 10s. 8d.
Wicford, 1 : 8s.
Achetvne, 1 : 32d.
Dodefort, 1 : 4s., given to Shrewsbury Abbey.
Lege, 1.
Cvneet, 2 : 20s.
Etvne, 1 : 4s.
Lestone, 1 : 4s.
Uptvne, 1 : 16s.
Hatlege, 1 : 2s.
Rodingtone, 1 : 6d.
Estvne, 1 : 4 measures of wheat.
Hanelev, 1 : 4s.
Nesse, 1 : 20s., and 600 eels.
Aitone, 1 : 10s.
Estone, 1 : rendering nothing.
Gleslei, 1 : 5s.
Aldeberie, 1 : 2s.
Hvelbec (Condover Hd.), 1. A winter not a summer mill (I. 255[b]).
Loclehvile, 1 : 1 suma of malt.
Pantesberie, 1 : rendering grain.
Wrdine, 2 : 3 sumas of wheat.
Svdtone, 1 : 8 sumas of grain.
Riseberie, 1.
Stoche, 1 : 12s.
Uptone, 1 : 12s. 1d.
Hvchefor, 1 : 8s.
Schentvne, 1 : 10s.
Hantenetvne, 1 : 400 eels.
Caiha, 1 : 4 sumas of Wich salt.
Asnebrvge, 1 : 3 sumas of grain.
Middeltone, 1 : 2s.
Rvitone, 1 : 8 sextars of fine grain.

* Owen and Blakeway, the historians of Shrewsbury, state that Ellesmere mill was the most valuable in the county, rendering £10 per annum. This erroneous statement is due to a misreading of Domesday : the sum of £10 being the entire value of the manor, and the rent of the mill not being stated. Hist. Shrewsbury, II. 10.

IX. DOMESDAY MILLS.

23. Schedule.

Sciropescire—*contd.*

Langeford, 1.
Catewinde, 1 : 5s., and 64 sticks of eels (with two fisheries).
Seinebre, 1 : 64d.
Hvgle, 1 : 64d.
Bardestvne, 1 : 3s.
Clvne, 1 : serving the Court.
Clone, 1 : 54d.
Do. 1 : 32d.
Cleie, 1 : serving the Court.
Harlege, 1.
Svdtone, 1 : 3s.
Sawesberie, 1 : 5s.
Baitvne, 1.
Vlvretone, 1 : 10s.
Cantelop, 1 : 10s.
Lege, 1 : 6s.
Vdevertvne, 1 : 24 vases of wheat.
Bvreford, 2 : 12 sumas of grain.

Sciropescire—*contd.*

Esseford, 1 : 4 sumas of grain.
Nene, 1 : 1 modium of wheat.
Claiberie, 1 : 2 sumas of grain.
Nene, 1 : 2s.
Lentevrde, 1 : 6s. 8d., and 6 sticks of eels.
Bvctone, 1 : 8s.
Melam, 1 : 20s.
Scentvne, 1 : 10s.
Cleberie, 1 : 4s.
Stantone, 2 : 26s.
Dodentone, 1 : 10s.
Stoches, 1 : 9 sumas of wheat, and the millers there taking charge of the hives.
Alledone, 1 : 5s.
Wistanestov, 1 : 5 sumas of grain; belonging to an enfranchised man (I. 260b).

CESTRESCIRE. (I. 263.)

Wivreham, 1 : serving the Hall.
Alretvne, 1 : a winter mill.
Cotintone, 1.
Estha, 1.
Maclesfeld, 1 : serving the Hall.
Hvrdingberie, 1 : a new mill.
Tillestone, 1 : 8s. (Millers mentioned among manorial servants.)
Christetone, 1 : 12s.
Prestvne, 1 : serving the Court.
Colbvrne, 1 : a winter mill.
Actvne, 1 : serving the Court.
Bero, 2 : 10s.
Estone, 1 : serving the Court.
Bvdewrde, 1 : serving the Court.
Bogedone, 1 : 16d.
Ferentone, 1.
Eitvne, 1 : 4s.
Bretone, 1 : 12d.
Witvne, 1 : 3s.
Stapleford, 1.
Gretford, 1. Osburn has a grain mill grinding for his Court.
Rolend, 1 : 3 modios of grain. Robert at Rolend holds of Hugh half the castle, &c., with mills there built and being built.
Diffard, 1 : 3s. 2d.
Inglecroft, 1 : 5s.
In Ripā 7 Mersham: *nil* (I. 269).

DERBYSCIRE. (I. 272.)

Onestune, 2 : 4s.
Waletune, 1 : 6s. 8d.
Mileburne, 1 : 3s.
Rapendune, 2.
Badeqvella, 1 : 10s. 8d.
Aisseford, 1 : 12d.
Hope, 1 : 5s. 4d.
Westune, 1 : 19s. 4d.
Bubedene, 1 : 10s.
Salle, 1 ; 20s.
Aitone, 2 : sites.
Vfre, 2 : sites.
Wineshalle, 1 : 5s. 4d.
Marchetone, 1 : 6s. 8d.
Sudtone, 1 : 2s.
Tizinctvm, 1 : 3s.

Derbyscire—*contd.*

Crochesalle, 2 : 18s.
Streitun, 1 : 5s.
Merstvn, 1 : 6s. 5d.
Dubrige, 1 : 10s.
Scrotun, 1 : and the site of another.
Sudberrie, 1 : 6s., and 100 eels.
Barctune, 2 : 20s.
Sudtune, 1 : 10s.
Brailesford, 1 : 10s. 8d.
Sirelei, 1 : 2s.
Hiltune, 2 : 10s.
Hoge, 1 : 9s.
Aitun, 1 : 4s.
Cobelei, 1 : 12d.
Boilestun, 1 : 12d.
Faitune, 1 : 8s.
Nortberie, 1 : 10s.
Dwelle, 2 : 8s.
Spondune, 1 : 5s. 4d.
Braideshale, 1 : 13s. 4d.
Giolgrave, 1 : 5s. 4d.
Chetelestune, 1 : 5s.

Derbyscire—*contd.*

Scorchestune, 1 : site.
Twiforde, 1 : 5s.
Iretune, 1 : 16d.
Mogintune, 1 : 3s.
Merchenestune, 1 : site.
Catenovre, 1 : 12d.
Esnotrewie, 1 : site.
Mortvne, 1 : mill, 6s. 8d., with the custody of the mill.
Ælwoldestvne, 1 : 12s.
Eghintune, 1 : 5s.
Echintone, 1 : 3s.
Barleyburg, 2 : 3s.
Palretune, 1 : 4s.
Essovre, 1 : 16d.
Englebi. 1 : site.
Denebi, 1 : site.
Tilchestune, 1 : site.
Drachelawe, 1.
Fornewerche, 1 : 2s.
Lillitune, 1 : 6s. 8d.
Sandiacre, 1 : 5s. 4d.
Stavelie, 1 : 5s. 4d.
Stanvtvn, 1 : 2s.

SNOTINGEHAMSCIRE. (I. 280.)

Burg Derby, 10 : £30. Here are ten mills. In the time of King Edward they rendered a total sum of £23 : now with the mills and the town of Ludecerc they render £30.
Do. 1 : the Abbot of Bertone has one mill in Derby.
Dvneham, 1 : 3s.
Bodemescel, 1 : 8s.
Elchesleig, 1 : 4s.
Mamesfeld, 1.
Tilne, 2 : 32s.
Clarlreburg, 2 : 32s.
Brotone, 1 : 5s.
Chenivetone, 1 : 10s.
Sudtone, 1 : 20s.
Sudwelle, 2 : 40s.
Do. 1 : 8s.
Lanvm, 1 : 16s.
Tilne, 1 : 30s.
Redford, 1.

Blideworde, 1 : which is in Ludeham.
Nortwelle, 1 : 12d.
Muscha, 1 : 2s.
Newerche, 1 : 5s. 4d.
Fladeburg, 1 : 12d.
Barnebi, 1 : 5s. 4d.
Rollestone, 1 : 27s.
Colingeha, 2 : 20s.
Nordmuscha, 2 : 20s.
Sceltune, 1 : site.
Marcham, 1 : 16s.
Tvxfarne, 1 : 10s. 8d.
Agemuntone, 2 : 30s.
Alretune, 1 : 6s. 8d.
Ætune, 2 : 20s.
Draitone, 3 : 50s.
Caldecotes, 2 : 20s.
Clipestune, 1 : 3s.
Warescope, 1 : 16d., and half the site of one.
Clunbre, 1 : 12d.

IX. DOMESDAY MILLS.

23. Schedule.

Snotingehamscire—*contd.*

Careltune, 2 : 21s.
Odesach, 2 : 16s. 4d.
Grestorp, 3 : 20s.
Marneha, 1 : 4s.
Westone, 1.
Odestorp, ¼ of 1.
Eprestone, 1 : 5s. 4d.
Troclavestune, 2 : 3s.
Bolvn, 2 : 32s.
Colewic, 1 : 5s.
Ostone, 1 : 5s. 4d.
Sibetorp, 1 : 20d.
Stanford, 1 : 6s. 8d.
Holmo, 1 : 5s.
Gvnnvlvestvne, 2 : 40s.
Cliftun, 1 : 12d.
Redeford, 4 : £3.
Lentune, 1.
Lidebi, 1 : 10s.
Lentune, 1 : 10s.
Tovetone, 2 : 8s.
Baseford, 3 : 25s. 4d.
Langare, 2 : 5s.
Stantune, 1 : 5s. 4d.
Horingeha, 2 : 40s.
Fiscartune, 2.
Granebi, 1 : 2s.
Hechelinge, 1 : 16s.
Calnestune, 1 : 2s.
Nordmuscha, 1 : 10s.

Snotingehamscire—*contd.*

Nordmuscha, 2 : 20s.
Wilgebi, ½.
Stoches, 2 : 20s.
Scelford, 1 : 4s.
Bonei, 1 : 12d.
Tevreshalt, 1 : 16d.
Cherchebi, 2 : 3s.
Epstone, 4 : 77s.
Gamelestun, 2 : 40s.
Alretun, 2 : 16s.
Cherlinton, 1 : 16s.
Holtone, 1 : 5s. 4d.
Watone, 1 : 4s.
Startorp, 1 : 5s.
Aigrun, 1 : 5s.
Landeforde, 2 : 12s.
Sibetorp, 1 : 10d.
Cvchenai, 2 : 8s.
Lecche, 1 : 2s.
Grenebi, 2 : 10s.
Stanford, 1 site.
Crunwelle, 1 : 12d.
Labeleia, 2 : 20s.
Nordmuscha, 1 : 10s.
Udeburg. 1 : 20s.
Odestorp, ½ : 4s.
Chinestan, 1 site.
Radeclive, 1 : 10s.
Baseford, 2 : 16s

ROTELAND. (I. 293.)

Gretha, 1.
Exentvne, 2 : 13s.
Hameldune, 1 : 21s. 4d.
Redlinctune, 2 sites.
Redlinctune, 1 : 16d. Held by Albert the cleric.
Tistertvne, 1 : 2s.
Witewelle, 1 : 12d.

EVRVICSCIRE. (I. 298.)—*York.*

Evrvic, 2 : 20s. New mills.
Wartre, 1 : 2s.
Basewig, 8.
Pochlinton, 2 : 5s.
Do. 1 : 2s.
Maltune, 1 site.
Calgestorp, 1.
Brvnbi, 1 : 6s.
Scireburne, 1 : 10s.
Niwebolt, 4 : 30s.
Evringham, 2.
Saletvn, 1 : 5s.
Stivelinctvn, 1 : 3s.
Bevreli, 3 : 13s.
Scogerbud, 1.
Welleton, &c, 3 : 18s.
Witebi, 1 : 10s.
Cattvne, 1 : 10s.

Evrvicscire—*contd.*

Ghigesbvrg & Middeltone, 1 : 4s.
Bolemere, 1 : 2s.
Hode, 1 : 4s.
Basevvic, 1 : 10s.
Lecheton, 1 : 13s.
Cherca, 1 : 8s.
Cliford, 1 : 2s.
Bramham, 1 site.
Estorp, 2 : 32s.
Hvson and Svdnicton, 1 : 8s.
Hotone, 1 : 28d.
Rodreham, 1 : 10s.
Hotone and Bileham, 1 : 4s.
Treclone, ½ : 5s.
Do. 2 sites.
Aldebvrne, 4.
Brvnton, 1 : 5s. 4d.
Alreton, 1 : 6s.
Scortone, 1 : 3s.
Bedale, 1 : 5s.
Brvntone, 1 : 5s.
Crachele, 1 : 4s.
Chirchebi, 1 : 5s. 4d.
Dalbi, 1 : 2s.
Bruntun, 1 : 5s.
Bochetone, 1 : 6s.
Do. 1 : 2s.
Mennistorp, 1 : 12s.
Chipeseh and Ledestune, 3 : 10s.
Ledes, 1 : 4s.
Saxtvn, 2 : 10s.
Berchinge, 1 : 3s.
Nivvchvsv, 1 site.
Ermesdale, 1 site.
Nortone, 1 : 5s.
Nevvose and Sutone, 1 : 6s.
Hanepol, ½ : 3s.
Torp, 1 site.
Smedetone, 1 : 2s.
Do. 2 : 9s. 4d.
Darningtone, 1 : 3s.
Agevvrde, 1 : 16d.
Rvhale, 1 : 3s.
Tateshalle, 3 : 42s.
Wircesbvrg, 1 : 2s.
Westrebei, 1 : 12d.

Evrvicscire—*contd.*

Rodewelle, 1 : 2s.
Dadesleia, Stantone, and ½ Helgebi, 3 : 40s.
Maltebi, &c., 3 : 16s.
Bodetone, 1 : 5s.
Tirneslavve, 1 site.
Mivehall, 1 site.
Merchesbvrg, 1 : 8s.
Hadevvic, 1 : 5s.
Honepol, ½ : 40d.
Cave, 2 sites.
Coningesburg, 2 : 32s.
Barneburg, 1 : 5s.
Tatecastre, 2 : 10s.
Stutone, 1 : 5s.
Bodeltvne, 1 site.
Ledelai, 1 : 2s.
Michelbram, 1 : 5s. 4d.
Spoford, 1 : 2s.
Lintone, 1 : 16s.
Estorp, 2 : 6s.
Fodstone, 1 : 5s.
Nadbartone, 1 : 5s.
Atvne, 1 : 5s.
Topeclive, 1 : 5s.
Otrengham, 1.
Catinvvic, 1.
Risvn, 1.
Nonninctvne, 1 : 3s.
Adelingsflvet, 1 : 10s.
Rodemese, 1 : 10s.
Svdtvne, 1.
Chirchebi, 1 : 4s.
Bvtecram, 1 : 20s.
Cotingham, 1 : 8s.
Widetone, 2 : 16s.
Lanton, 1 : 5s.
Nortone, 1 : 10s.
Screngham, 1 : 20s.
Apletone, 1 site.
Torp, 1 site.
Hanbretone, 1 : 2s.
Nevtone, 1 site.
Scarpenbec, 1 : 2s.
Stocheslage, 1 : 10s.

IX. DOMESDAY MILLS.

LINCOLESCIRE. (I. 336.)

23. Schedule.

Stanford, 1: 30s. Which Eustasius of Huntingdon, who was one of the sokemen owning lands here, removed or withheld.
Do. ½: 15s. One of the sokemen had eight houses under him and half a mill of 15s.
Do. ½. In the same town Azor had seven houses and half a mill; now Gunfred has them.
Do. 1: 40s. In King Edward's time belonging to the Abbot of Bury.
Do. In the time of King Edward there were in five divisions of Stanford various houses and half a mill, the whole of which rendered all customs to the king.
Enedune, 1: 5s. 4d., and 1 site.
Bodebi, 1: 3s.
Oustorp, 1: 12s.
Grantham, 4: 12s.
Herlavestune, 2: 2s.
Sudstoches, 2: 21s. 4d.
Nougtone, 1: 13s. 4d.
Burchestone, 2: which Turned had.
Basingeham, 2: 32s.
Chirchetone, 1: 12d.
Castre, 4: 13s. 4d.
Hornecastre, 2: 26s.
Stalingburg, ½: 32d.
Chelebi, ½: 3s. 4d.
Langetone, 1: 9s.
Beningurde, 1 site.
Sundertorp, 1: 10s.
Agetorne, 2: 4s.
Tesforde, 1: 4s.
Stalinburg, 1 site.
Dusebi, 1: 3s.
Billingeburg, 1 site.
Wime, 1 site.
Estone, 1: 8s.
Turgeibi, 1 mill and 1 acre of meadow, which Norman of Areci holds unjustly.
Endrebi, 1 site.
Spilesbie, 2: 9s.
Caditon, 3½: 20s.
Gunfordebi, 2: 16s.
Alesbi, 1 site.
Biscopetorp, 2: 5s.
Welletone, ⅛ part of a site.
Grosby, 1: 3s.
Stalinburg, ½: 3s.
Neteltone, 2: 3s.
Rase, 2: 6s.
Tavelsbi, 1: 2s., and another which belongs to Grosbi.
Torp, part: 12d.
Martone, 1: 8s.
Stratone, 1: 8s.
Clinchebi, 1 site.
Torp, ⅓ of 2: 7s.
Cocrintone, 2 parts of one: 2s.
Aschebi, 2: 3s. 6d.
Do. 1: 3s.
Levesbi, 2: 8s.
Wichale, 2 parts: 26d.
Dodintune, ½: 3s.
Couenebi, 1: 4s.
Nortune, 1 site.
Welletone, 5: 40s.
Messingeham, 1: 5s.
Elehain, 1 site.
Chelebi, 1: 6s. 8d.
Aresbi, 1: 3s.
Billesfelt, 1: 12d.
Eslaforde, 8: £10.
Corninctune, 2: 16s.
Hacam, 2: 13s. 4d.
Ludes, 13: 60s.
Chenebi, 1: 4s.
Scotere, 1 and ½ of 2: 8s.
Hibaldeston, 1: 4s.
Holm, 1: 4s.
Corninctune, 1: 21s. 4d.
Bastune, ½. Here is a church and half a mill.
Nortchelefei, 1: 7s.
Alesbi, 1½: 9s.
Gunresbi, 1: 6s.
Hadeclive, 2: 8s.
Belesbi, 2½: 12s.
Willetune, 1: 10s.

Lincolescire—*contd.*

Hache, 4 : 30s.
Burtune, 1 : 12s.
Fulebec, ½ : 10s.
Beninctun, 4 : £4.
Herigberi, 2 : 10s.
Stoche, 2 : 7s. 4d.
Northniche, 1 : 5s.
Grantham, 1 : 8s.
Suabi, &c., 6 : £4, 16d.
Langetune, 9 : 20s.
Hamingebi, ½ : 7s.
Staintune, 1 : 12d.
Tadewelle, 1 : 16d.
Rocheland, 1 : 2s.
Farforde, 1 : 3s.
Wadintune, 2 : 11s.
Medricesham, 1 : 8s.
Ormesbi, 1 : 32d.
Chetelesbi, 1 : 32d.
Tatenai, 1 : 16s.
Do. site.
Osgotebi, 1 : 3s.
Clachesbi, 1 : 2s.
Torgrebi, 3 parts of 1 : 5s.
Crosbi, 3 : 8s.
Bliburg, 1 : 12d.
Normanebi, 2 : 5s. 4d.
Tonestale, 1 : 2s.
Scotone, site.
Hibaldestov, 1 : 5s.
Chelvingehort, ½ : 3s.
Nevhvse, 1 : 2s.
Chelebi, site.
Beltesforde, 2 : 18s. 8d.
Colchesbi, 1 : 4s.
Dunninctune, 2 : 17s. 4d.
Ludesforde, 1 : 12d.
Ellingetune, 1 : 8s.
Bolinbroc, 3 : 10s.
Radebi, 1 : 12s.
Hundelbi, 1 : 5s.
Haltun, &c., 4 : 24s.
Archintone, ½ site of one.
Brune, ⅛ : 20d.
Hundintone, site.
Winelestorp, 2 : 20s.
Osgotebi, 1 : 3s., of which the bishop has the soke.
Tavelsbi, 4 : 16s. 4d.

Lincolescire—*contd.*

Tavelsbi, 1 : 3s.
Lastone, ½ : 12d.
Waletone, 1 : 2s.
Neteltvne, 2 : 10s.
Welletune, 2 parts of one site.
Grentewelle, 1 : 5s.
Binnibroc, 2 : 20s.
Griteforde, 2 : 10s.
Vlestanetorp, 3 : 15s.
Do. 1½ : 8s. 6d.
Abvrne, 1 : 20s.
Oresbi, 1 : 3s.
Chevremont, 1 : 2s.
Alchinton, 1 : 3s., and 1 site
Ristone, 2 : 5s.
Odenebi, 1 : 2s.
Stainton, 1 : 12d.
Lagesbi, 1 : 6d.
Ferebi, 1 : 10s.
Scantone, 1 : 2s.
Wintringeham, 3 : 37s. 4d.
Bertone, 2 : 40s.
Bardenai, 1 : 8s.
Badeburg, 1 : 8s.
Ellingetone, 1 : 16s.
Risvn, 1 : 12d.
Lvzebi, 1 : 3s.
Do. 1 : 12d.
Witham, 1 : 20s.
Do. 1 : 12s.
Scheneldebi, 2 : 13s.
Widerne, 1 : 15s.
Welle, 1 : 15s.
Holm, 1 : 13s. 4d.
Stalinbvrg, 2½ : 10s.
Folchingeham, 1 : 10s. 8d.
Clachesbi, 1 : 2s.
Scotstorne, 1.
Cheftesbi, 1 : 16d.
Dodintone, ½ : 3s.
Merestone, site.
Bolinburg, 1 : 6s. 4d.
Ulnesbi, 1 : 5s. 4d.
Do. site.
Habvrne, 1 : 2s.
Hechelinge, ½ : 3s.
Lindvde, 2 parts of 1 : 2s.
Dribi, 1 : 12d.
Rase, 1 : 12d.

IX. DOMESDAY MILLS.

23. Schedule.

Lincolescire—*contd.*

Toresvve, 2 : 3s.
Rodevvelle, 2 : 3s.
Brachenburg, 4 parts : 2s.
Cochrintvne, ½ : 3s.
Offintvne, 3½ : 40s.
Talintvne, 1 : 12s.
Merestvne, 2 : 8s.
Tauvlesbi, 1 : in the soke district of the Bishop of Bayeux.
Brune, ⅛ : 3s. 4d.
Hagetorne, 1 : 16d.
Revrne, 1 : 3s.
Bvlesforde, site.
Tavelsbi, 3 : 16s.
Adredebi, 1 : 2s.
Sumerdebi, ½ : 10d.
Wizebi, 1 : 4s.
Stratone, 1 : 10s. 8d.
Stigandeli, 2 : 2s.
Torp, 2 : 7s.
Tvnbi, 2 : 20s.
Westrecale, 1 : 3s.
Sassebi, 2 : 3s.
Radebi, ½ site.
Barevve, 1 : 13s. 4d.
Torp, 2 : 6s.
Normanebi, site.
Stantone, site.
Stunblebi, 1 : 9s. 4d.
Paintone, 1 : 6s.
Stoches, 2 : 10s.
Westbitham, 1 : 4s.
Bitham Hd., 1 : 3s.
Hacberdingham, 1 : 18d.
Beltone, 3 : 30s.
Gvnfordebi, 2 : 16s.
Westorp, 3 : 40s.
Bertune, 1 : 2s.
Branztvne, 4 : 27s.
Cherchebi Hd., 4 : 21s. 4d.
Do. 2 : 20s
Medricesham, 2 : 12s.
Stalinburg, site.
Lovingeham, ½ : 4s.
Torgrembi, 1½ : 8s.
Flichesburg, 2 sites.
Clachesbi, ¼ : 8d.
Messingeham, 1 : 5s.
Cadecote, 2 sites.

Lincolescire—*contd.*

Dunestune, 6 : 24s.
Ulnesbi, ½ : 10s., and 50 eels
Neteltone, 1 : 12d.
Waragebi, ½ : 12d.
Bertone, 1 : 2s.
Rase, 1 : 2s.
Tavelesbi, 3 : 12s.
Do. 3 sites.
Grimesbi, 1 : 4s.
Torentune, ½ : 3s.
Caretorp, ½ : 10s.
Torintune, 2 : 20s.
Scrivelesbi. 1 : 13s. 4d.
Tadewelle, 2 : 14s.
Holtham, 2 : 13s. 4d.
Sidestam, 6 : 50s.
Staintone, site.
Tavelesbi, 1.
Cadinton, 1 : 8s.
Do. 1 : 11s.
Coerinton, site.
Widcale, ⅛ : 4s.
Hagetorne, 1 : 12d.
Brune, 3 : 30s.
Do. 2 parts : 5s.
Randebi, 1 : 10s. 8d.
Staintone, 2 : 5s. 8d.
Neteltone, 3 : 5s.
Sevrebi, 1 : 2s.
Cotes, 1 : 12s.
Lindude, ⅛ : 8d.
Torgrebi, 4 parts of 1 : 2s.
Belesbi, ½ : 3s.
Waragebi, site.
Svinhope, 1 : 5s.
West Depinge, 4 : 40s.
Wivelesforde, 1.
Casvic, ½ : 12s.
Binnisbroc, 1 : 5s.
Merestune, 2 : 22s.
Bvrnelle, 1 : 3s.
Hacham, 1 : 5s. 4d.
Do. site : 13s. 4d.
Torgrebi, 1 : 3s.
Vensbi, ½ : 3s.
Magna Pantone, 5 : 44s.
Parva Pantone, 4 : 63s.
Germuntorp, 3 : 25s. 4d.
Exentune, 2 : 13s.

23. Schedule.

Lincolescire—*contd.*

Witewelle, 1 : 12d.
Binnibroc, 1 : 5s.
Herigerbi, 1 : 4s.
Tudetorp, 3 : 40s.
Gunfordebi, 1 : 5s.
Burtun, 1 : 2s.
Toft, 1 : 10s.
Sudtorp, 1 : 2s.
Hogtone, 2 : 26s. 8d.
Wellebrvne, 1 : 2s.
Bergebi, 1 : 3s.
Caschingetorp, 2 : 4s.
Stanwald, 1 : 4s.
Sechebroc, 3 : 16s.
Breseburg, 2 : 20s.
Brune, $\frac{1}{3}$: 3s. 4d.
Haconesbi, 1 : 12d.
Cherchebi, $\frac{1}{2}$: 5s.
Gunnebi, 1 : 12d.
Bliburg, 1 : 2s.
Reschintone, 3 : £4, 12s. 8d.
Westburg, 2 : 30s.
Claipol, 1 : 10s.
Burg, 1 : 20s.
Brune, $\frac{1}{6}$: 18d.
Beltone, 2 : 12s.
Hochtune, 2 : 30s.
Ulvesbi, $\frac{1}{2}$: 3s.
Aschebi, 1 : 12s.
Colstevorde, 2 : 2s.

Lincolescire—*contd.*

Wadingeham, 1 : 2s.
Aresbi, 1 : 3s.
Neteltone, 1 : 12d.
Tadeuuelle, 1. The jury of the Wapentake say that this mill which was Agemund's, and which Lambert and Gozelin his son had after him, Robert Dispencer ought to have with his land.
Clachesbi, 1. Gozelin, the son of Lambert, should have here one mill which Goisfred, a man of Ivo Taillebosc, has invaded and seized from him.
Lude, 1. The Bishop of Lincoln claims here one mill of Earl Alan, and the jury say that it ought to belong to the said bishop.
Church of Caistor, 1. A mill with other property granted to the Church by King William.
Crosbi, 1. William Blundell ought to have one garden on the land of Ivo Tailbois, but is hindered on account of the mill, which was not there in the time of King Edward.

EXCESSA. (II. 1.)

[*Various places are entered in this and the following lists as having mills in the time of Edward, but not in the time of William, and are marked respectively* t. (*tunc, then*) *and* m. (*modo, now*).]

Gernestedam, 1.
Celmersfort, 1.
Wochadunam, 1.
Waldham, 2.
Hobruge, 1.
Brumseldam, 1.
Legram, 1.
Mosam, 1.
Nutleam, 1.
Halingebriam, $\frac{1}{2}$.
Alferestuna, 1.
Rodinges, 1.
Waledana, $1\frac{1}{3}$.
Witham, 1.
Cringefort, 1.
Legam, 1.
Stanestedam, 1.
Vdeham, 1.
Wendena, 2.
Benedfelda, 1.
Widemondefort, 1.
Winnhov, 1.
Briciam, 1.
Richeham, 1.
Accleiam, 1.
Scortegrava, *t.* 1 *m.* 0.

IX. DOMESDAY MILLS.

23. Schedule.

Excessa—*contd.*

Vltingham, 2.
Nortunam, 1.
Curlai, *t.* 1 *m.* 0.
Domanuam, 1.
Pentelava, 1.
Burneham, 1.
Baduuan, 1.
Wdeham, 1.
Terlinga, 1.
Favisledam, 1.
Beuentren, 8.
Meldonan, 1.
Deppedana, 1.
Hidingforda, 1.
Cestrefordam, 1.
Becangram, 1.
Caldefordam, 1.
Berdestapla, ½.
Witham, 1.
Beuentreu, 1.
Odelesforda, 2.
Phincingheseldam, 1.
Westrefeldam, 1.
Staningam, 1.
Bictriceseia, 1.
Lalefordam, 1.
Newport, 2.
Coghessalam, 1
Brochinges, 1.
Stiesteda, 1.
Watbricteshemam, 1.
Wenesta, 1.
Legram, 1.
Raines, 1.
Celmeresfort, 1.
Wicham, 1.
Writbla, 1.
Lalinge, 1.
Walham, 1.
Lessendena, 2.
Clachintuna, 1.
Tillingham, 1.
Tidwoldetuna, 1.
Ælduluesnasam, 2.
Chellenedana, 1.
Leituna, 1.
Pheringas, 3.
Keluenduna, 1.
Molesham, 1.

Excessa—*contd.*

Mucingam, 2.
Hocheleia, 1.
Tolestiam, 1.
Cadenhov, *t.* 1 *m.* 0.
Litelbyriam, 4.
Strathala, 1.
Witham, 1.
Breddinchon, 1.
Herlana, 1.
Ramesdenam, 1.
Currincham, 1.
Bractedam, 1.
Langhon, 1.
Birdefeldam, 1.
Wrabenasam, 1.
Estram, 1.
Tacheleia, 1.
Bilichangram, 1.
Phenstedam, 2.
Baduuen, 1.
Phenge, 1.
Pacingas, 1.
Melesham, 1.
Torindunam, 1.
Nutleam, 2.
Cogheshalam, 1.
Ruenhale, ½.
Clare, 1.
Teiam, 1.
Bocchestedam, *t.* 1 *m.* 0.
Stanfort, 1.
Borham, 1.
Monehalam, 2 parts: 20s.
Legam, 1.
Halingebiam, 1.
Chellenadanam, 1.
Raines, 1.
Gerham, 1.
Causelda, 1.
Haltestedam, 2.
Polheia, 1.
Tachestedam, 2.
Gestingetorp, *t.* 1 *m.* 0.
Stanbruge, 1.
Hocheleiam, 1.
Rochefort, 1.
Plumbergam, 1.
Puteseiam, 1.
Hacheleia, 1.

Excessa—*contd.*

Halingebran, ½.
Dommanua, 1.
Clanelinga, 1.
Eiland, 1.
Brachestedam, ½.
Dommanua, 1.
Halsledam, 1.
Bercalta, *t.* 1 *m.* 0.
Birdefeldam, 1.
Sanford, 1.
Stapleford, 1.
Almested, 1.
Hadfeldam, 1.
Blundeshalam, 1.
Ramesiam, 1.
Langhefordam, 1.
Stabingam, 1.
Henies, 1.
Cice, 1.
Canedfeldam, 1.
Haingheham, 1.
Coles, 2.
Sceringam, 1.
Perindunam, 1.
Leintunam, 1.
Taindenam, 1.
Ruindune, 1.
Nasingam, *t.* 1 *m.* 0.
Sturmere, 1.
Raines, 1.
Meteinges, 1.

Excessa—*contd.*

Delham, 2.
Nutleam, 1.
Mapledestam, 1.
Fifhardam, 1.
Leintunam, *t.* 1 *m.* 0.
Waltham, 1.
Colun, 1.
Hidingham, 1.
Stanestedam, 1.
Colun, 1.
Bercolt, 1.
Listunam, 1.
Eistanes, 1.
Cestrefort, 1.
Byrdefeldam, 1.
Erleiam, 2.
Forham, 1.
Cingheuuella, 1.
Estanes, 1.
Seiddinchov, 1.
Wilcumestou, 1.
Wighebergam, *t.* 1 *m.* 0.
Branduna, 1.
Pice, 1.
Hasingham, 1 : 15s.
Crepingam, *t.* ½ *m.* 0.
Colecestra, *t.* 1 *m.* ½ and ¼.
In Essex Hugo de Montford has invaded and seized from the king two mills (and other property).

NORFULC. (II. 109.)

Sutmere, 1.
Wanelvnt, 1.
Baiafeldam, ¼ : 10s. 8d.
Wistune, 1.
Galsingaham, 2½.
Folsham, 2.
Intanerham, 1½.
Colebei, 1.
Norwic. The burgesses had among them half a mill, and the quarter part of one mill.
Tetford. Of two mills, the king has two parts, and the consul the third part. Of the third mill the king has two parts, and of these two parts the earl has one third. These mills are in the district beyond the water towards Norfolc (II. 118b). In the other district towards Suthfolc in the soke lands of St. Edmund's is one mill : and the bishop has one mill and half a church, &c.
Saham, 1.
Dentuna, 1.
Holt, 5.
Huneworda, 1.
Hohttune, 2.
Fachenham, 3.

IX. DOMESDAY MILLS.

23. Schedule.

Norfulc—*contd.*

Sparle and berewicks, 6.
Holm, 1.
Nieutona, 2.
Chineburlai, 1.
Boethorp, 1.
Runhalam, 1.
Cranawwordam, 1.
Suatingam, 2.
Flokethorpe, 1.
Reineham, 1.
Stinecai, ½.
Suaringam, 2.
Turesfort, 1.
Intreus, 1.
Radanahallam, 1.
Helgetuna, 1.
Newestona, 1.
Stou, 1.
Bucham, 2.
Culuertestuna, 1.
Cheninkehala, 2.
Cuidenham, 1.
Bumeham, 2½.
Acle, 1.
Sistanda, 1.
Tyrninga, ½.
Saxthorp, 2.
Crachefort, 1.
Castre, ½.
Malteby, ½.
Ettuna, 1.
Hundestanestedam, 1.
Crokestuna, 1.
Lawendic, 1.
Wimunda, 6.
Methelwalde.
Meleham.
Elesham.
Manictune.
Hersam, 2.
Dicingaha, 2.
Horsteda, 3.
Stanningehalla, 2.
Colestuna, 1.
Stontuna, 1½.
Grimestuna, 3.
Snettesham and berewicks, 13½.
Krigelforda, 1¾.
Rustuna, 1.

Norfulc—*contd.*

Snafha, 1½.
Nereforda, 1½.
Fulenduna, 1.
Pikenha, 1.
Coteseia, 2.
Wranphincham, ½.
Toketorp, 1¼.
Westfelda, 1.
Ling, 1.
Belega, 1.
Hameringshala, 1.
Lekemha, 1.
Humiliart, 1.
Bavenburc, 1.
Torp, 1.
Bereforda, ½.
Sastorp, 1½.
Wica, ½.
Herlinga, 1.
Dunestun, 1.
Stratuna, ⅓.
Crinaforda, ⅛.
Witcingeham, 2.
Scerepham, 2 mills: and of two mills four parts.
Wabrunna, 2.
Hadenaham, 1.
Glorestorp, 3.
Culuerstestuna, 1.
Sasilingaham, ⅛.
Frisam, 1.
Hosforda, 1.
Horsham, 1.
Stinetuna, 1.
Kerdestuna, ¼.
Hatforda, 1.
Helsingam, 2.
Hederfeda, 1.
Fundehala, 1.
Baketuna, 2.
Tanerham, ¼.
Mortost, 1.
Ultrincham, ½.
Bernincham, ⅓.
Erminclanda, ⅓.
Hobuist, ½.
Pastuna, 1.
Walsam, 1.
Acre, 2.

IX. DOMESDAY MILLS.

23. Schedule.

Norfulc—*contd.*

Grimestuna, 1.
Congheham, 1.
Nidlinghetuna, 1.
Couestuna, 2.
Cranwisse, ½.
Hecham, 3½.
Do. ½.
Suetesham, 1.
Tostes, 1.
Rokelun, 2 halves.
Nortuna, ½.
Wicam, 1.
Gressenhala, 2.
Leceesham, 1.
Frandesham, 1½.
Scernenga, 1.
Ruhham, ½.
Berham, 1½.
Berch, 3.
Fugalduna, 1.
Hildeburh, 3.
Acra, ½.
Budeneia, ¼.
Pichenham, 1.
Sculetorpa, 3.
Barseham, 5½.
Fulmotestuna, 1.
Rudeham, 2.
Tatessete, 2.
Bruneham, ⅛.
Helgetuna, ½.
Reieborh, 1.
Wiventona, ½.
Gimingeham, 2.
Torp, 2.
Norrepes, 2.
Gersam, 1.
Furstede, ½.
Tedport, 3. One value 32s. held by Turstin, a burgess, is claimed to be his by grant of the king, but the Hundred is unaware of such grant.
Penteleiet, 3.
Pliceham, 1.
Rincteda, ⅛.
Hunestatuna, 2.
Wadetuna, 1.
Totintuna, 1.
Scotessa, ½.

Norfulc—*contd.*

Haganworda, 2.
Brumestada, 1.
Hethella, 1.
Chesewic, 1.
Kitrincha. *t.* 1 *m.* 0.
Florenduna, 1.
Hadestuna, 1.
Tuanatuna, 1.
Hametuna, 1.
Sustede, 1.
Sutfelle, 4.
Aldeburc, 1.
Suttune, 1.
Sterestuna, 2.
Bruneham, 2 parts.
Sithingam, 1.
Stokes, ¾.
Erpincham, 1.
Buc, ½.
Wicmera, ⅛.
Felmicham, 1.
Stratuna, ½.
Cringaforda, 8 parts.
Cresincghaham, 2.
Gaiuude, 1.
Tornham, 1.
Elmenham, 4.
Milham, 1.
Tornedis, 3.
Hindringaham, 1.
Hidolfestunam, 1.
Helmingham, 1.
Stratuna, 1.
Secesfordam, 4.
Eccles, 3.
Langaham, 1.
Gunetune, 1.
North Langale, 1.
Hunestanestuna, ½.
Sexelingaha, ½.
Blielingam, 1 and 7 parts.
Suuterlea, 1.
Burmingham, 1: which Godric now holds under the king.
Sonesta, *t.* 2 *m.* 0.
Toketorp, ½.
Cressingaham, ½.
Godestuna, 5.
Feorhov, ½.
Wasingha, 1.

IX. DOMESDAY MILLS.

23. Schedule.

Norfulc—*contd.*

Sparham, ½.
Meltuna, 1.
Coleneia, 1.
Dunestun, 1.
Hechincha, 1.
Wermegai, ¼.
Westbruge, 1.
Rynghetona, 1.
Lecham, 1.
Winebergam, 1.
Eddenham, ½.
Buccham, *t.* 1 *m.* 0.
Guidenham, 1.
Nortuna, 1.
Wenlingam, 1.
Rungehetune, 1.
Feltunella, 1.
How, 1.
Marthingeforda, 2.
Castru, ½.
Thorp, *t.* 1 *m.* 0.
Lodua, 1.
Torp, 1.
Kercheby, 1.
Mareham, 1.
Nortwalde, 2.
Mondefort, ½.
Brugam, 2.
Derham, 3.
Torp, 1.
Brunester, 1.
Dodenham, 1.
Pullaham, 1.
Brocestram, 1.
Turgartuna, 1.
Scotesham, 1.
Grenesuill, 1.
Saisselingham, 1.
Scotohou, 1.
Caletorp, 1.
Ead, ⅓.
Tuit, 1.
Hobnisse, ½.
Tutineghetuna, 1.
Horningham, 1.
Walsam, 1.
Pastuna, 1.
Wrdestedam, 1.
Haningam, 1.

Norfulc—*contd.*

Hecham, 2.
Wella, 2.
Mideltuna, 1.
Herlingam, 1.
Creic, 1.
Taseburch, ⅓.
Suanetua, 3.
Lecesham, 1.
Derham, 1.
Croukethor, 1.
Holekinka, 1.
Heinestede, ½.
Tauresham, ¼.
Falla, ¼.
Bukestuna, 1.
Ohbouuessa, 1.
Markeshalla, 2.
Thurketliart, 1.
Caldanchola, 1.
Winetuna, 1.
Walsingaham, 1½.
Stinecai, 1.
Witewalla, 2.
Witeingeham, 1.
Scotohu, ⅓.
Penestorpe, 1.
Nechetuna, 1.
Cressiagaham, 1.
Parva Cressiagaham, 1: paying nothing.
Do. 4 parts of a mill: invaded.
Bodeneia, 1.
Acre, 4½.
Wretham, 1.
Budeneia, 1¼.
Langaford, 2.
Bruneham, 1.
Frouuesham, 1.
Gaituna, ½.
Reineham, 3.
Mideltuna, 1.
Buchenham, ½.
Rokeliunt, ⅛.
Possuic, 1.
Tewda, ¼.
Helmingeham, 1.
Erminclanda, 2 parts.
Leringaseta, 1.

IX. DOMESDAY MILLS.

23. Schedule.

Norfulc—*contd.*

Baiaselda, ¾.
Maidestuna, 1.
Spikesuurda. 1.
Ferlebruna, 1.
Oxenburh, 2.
Dudelingatuna, 1.
Idlingetuna, 1.
Hunaword, 1.
Erpincham, 1.
Babinghelea, 1.
Dentuna, ½.
Tibenham, 1.
Scedgetuna, 1: paying nothing.
Ristuna, 1: worth 2s.
Hamehala, 2.
Boielvnd, 1.
Sculdeham, ⅓.
Wiggenham. ½.
Titeshala, 1.
Wiclurde, 1.
Scatagrana. 2.
Billingeford, 1.
Meltuna, 1.
Sparham, ½.
Lothna, ½.
Babinkeleia, half of 2.
Dersincham, 1.
Smetheduna. 2.
Esuaringa, 1.
Reinburh, 1.
Parva Reienbvrh, 1.
Binneham, 1.
Lothua, ½.
Brom, 1.
Sterstuna, 1.
Hanningam. 1.
Walecota, 2.

Norfulc—*contd.*

Edisfeldan, 1.
Estodeia, 3.
Gutheketuna, 1.
Caletorp, ⅓.
Billingeforda, 1: paying nothing.
Taterforda. 1.
Ramiltorp, ⅓.
Dnham, 1.
Holcham, 1.
Stokes, 1.
Torp, ½.
Rincteda, 1.
Cherebroc, 1.
Bretham, 2.
Heinestede, ½.
Stanforda, 1.
Torp, ½.
Atlebur, 2 parts.
Alio Atlebur, ½.
Grimestuna, 1.
Helingetuna, 1.
Sasilingaham, ½.
Scernebruna, 1 ½.
Othestranda, 1.
Pikeham, 1.
Terrā Arbale, 1.
Salla, ½.
Luringam, 1.
Guella, 1.
Oxenedes, 1.
Bernham, 1.
Hailesduna, 2.
Mateshala, 1.
Lesiete, 1.
Benincham, 1.
Wabrune, 1.

SVDFVLC. (II. 281.)

Tornai, 1.
Ringpefella, ½.
Dermodesduna, 1.
Sutberie, 1.
Cormerdam, 1.
Bercolt, 1.
Sceneleia, 1.
Bongeia, 2.
Mitdenehalla, 1.
Hintlesham, 1.
Branfort, 1.
Baro, 1.
Cambas, 3½.
Do. 1.
Cratingas, ½.
Asce, 1.

IX. DOMESDAY MILLS.

23. Schedule.

Svdfvlc—*contd.*

Torentuna and Waddestuna, 1.
Gespeswiz, ½.
Netlesteda, 1.
Todenes, 1.
Framesdena, 1.
Bernha, 1.
Uggiceheala, *t.* 1 *m.* 0.
Bunghea, 1¾.
Do. 1¼.
Ilcheteleshala, ½.
Eduardestuna, 1 winter mill.
Cratinga, ¼.
Belesteda. 1.
Chiletuna, 1.
Indersa, 1.
Suapes, 1.
Holestea, 1.
Ludham, 1.
Eiam, 2.
Torentuna, 1.
Sutburna. 1.
Usseworda, 1.
Farnham, 1.
Plegeforda, 1.
Beria, 1.
Healesuurde, 1.
Kyluertestuna, 1.
Halgeston, 1.
Remlesham, 1.
Codenham, ½.
Stanertuna, 1.
Weibrada, 4¾.
Bernham, 1.
Bringas, 2.
Belesham, ½.
Beleham, ⅔ of one and ⅓ of another; ⅙ of one.
Belham, 1.
Staham. A certain part.
Waletuna, 1.
Kuluerestuna, 2.
Kinebroh, 1½.
Ferneham, 1.
Menham, 1.
Resebi, ½.
Buckeshala, ½.
Clainduna, 1.
Blacham, 2.
Cokeli, 1.

Svdfvlc—*contd.*

Teluetteham. 1.
Wirilintona, 1.
Todeha, 1.
Blideforda, 1.
Almaha, ⅓.
Neotuna, 1.
Leacforda, 2 mills now: ii molin̄ ℈ [modo].
Hemegratham, 1 mill now: i molin̄ ℈. [The style of this and the preceding entry is rare; but the Saxon ℈ is at times used as the initial for "mol.," as at Cothefelda (II. 359); otherwise the reading might be understood to mean manor mills: molin̄ ℈.]
Fornham, 1.
Kkewortha, 1.
Sexham, ½.
Flemingtuna, 1.
Hyrningwellam, 2.
Malaforda, 2.
Cothefelda, 1 winter mill.
Grotena, 1 winter mill.
Pachenham, 1.
Do. 1 winter mill.
Genonesae Forham, 3.
Ingham, 1.
Richingehalla, 1 winter mill.
Stoua, 1.
Hopetuna, 1.
Beordewella, 2 parts.
Sapestuna, 2.
Wridwella, 1.
Bernham, 1.
Euestuna, 2.
Gnedeshalla, 1.
Torp, 1.
Mendham, 1.
Corsforde, 1.
Cerleswrda, 1.
Merlesforda, 1.
Linburna, 1.
Acle, 1.
The city where desired to be buried St. Edmund, king and martyr, 2.
Hetlega, 3.

Svdfvlc—*contd.*

Illeleia, 1.
Sekeforda, 1.
Cratinga, $\frac{1}{3}$.
Burghestala, 1.
Reindune, 1.
Alsildestuna. 1.
Hoxana, 2.
Topesfelda, 1.
Babergam, 1.
Humbresfelda, 1.
Seilanda, 1.
Flixtuna, $\frac{1}{8}$.
Do. $\frac{1}{2}$.
Frakenaham, 1.
Laringahetha, $\frac{1}{2}$.
Clamesford, 1.
Stoches, 1.
Berchingas, 1 mill and the race or pool or sluice [exclusam] of another, and in this race Robert Malet has a share.
Bercham, 2.
Niedinga, 1.
Brihtewella. 2.
Meltuna, 1.
Usforda, 1.
Hov, 1.
Vdeham, 1.
Capeseia, 1.
Cratingas, 2.
Careseia, 1.
Claram, 1.
Hunendana, 1.
Deselinga, 4.
Westlea, 1.
Canauatha, 4.
Bure, 1.
Ilelega, 1.
Gipeswig, 1.
Badeleia, $\frac{1}{2}$.
Stanesfelda, 1.
Vratingam, 1.
Do. 1.
Celeburna, 1.
Stokes, 2.
Withermers, 1.
Polesteda, 1.
Eilanda, 1.
Aluenelega, 1.

Svdfvlc—*contd.*

Stratfort, 1.
Peituna, 1.
Hereswella, 2.
Todenham, 1.
Glemham, 1.
Leiham, 1.
Fineberga, 1.
Langhedana, $\frac{1}{4}$.
Machetuna, *t.* 1 *m.* 0.
Gretingaha, 1.
Stanesda, 1.
Ultuna, 1. But the half of it is challenged by the Earl of Morton: so says the Hundred.
Etclingaham, 1.
Dagaworda, 1.
Torneia, 1.
Cratinga, $\frac{1}{4}$ of one, $\frac{1}{2}$ of another.
Belesteda, 1.
Ledringaham, 1.
Turmituna, 1.
Kitidunam, 1.
Wlteskeou, 1.
Wankeforda, 1.
Henham, 1.
Stanfella, 1.
Aretona, 1.
Belsteda, 1.
Ialelham, 2.
Cercesfort, 1.
Stotuna, 1.
Manesfort, 1.
Lauenham, 1.
Fachenham, 1.
Bura, *t.* 1$\frac{1}{2}$ *m.* 0.
Merlesham, 1.
Waldinga, 1.
Aluredestuna, 1.
Ilelega, 1.
Mellinga, 1.
Branham, 1.
Wenham, 1.
Torintuna, 1.
Ranauadisc, 1.
Seilam, 1.
Mealla, 1.
Staffort, 1.
Herchesteda, 1.

IX. DOMESDAY MILLS.

23. Schedule.

Svdfvlc—*contd.*

Gutthulues Fordham, 1.
Brantestuna, 1.
Cratinga, 1.
Ecclingaham, 1.
Codenham, ½.
Bura, 1.
Codenham. From the mill of Belingesford, 7s. 4d.
Hecham, 1.
Torp, 1.
Giswortham, 1.

Svdfvlc—*contd.*

Westuna, 1.
Icsewrda, 1.
Perreham, 1.
Kelebroc, ½.
Parua Belinges, 1.
Campeseia, 1.
Glereuinges, 1.
Horan, ½.
Kauanadis, 1.
Gnedassala, ½.

CHAPTER X.

THE MODERN WATERMILL.

1. In a work of this nature, from which practical technicalities are necessarily omitted, only comparatively little is to be said of the progress of the watermill to its stage of modern perfection. But among the few topics which definitely come within our province is the collateral subject of the establishment

Ludlow Mill and Causeway.—*Sketch by J. Salmon.*

and development of causeways for heading up the waters of streams to secure and control the flow to the

X. THE MODERN WATERMILL.

1. Causeways, &c.

wheel. We have seen that from Roman times the obstruction of navigable streams by mill-dams was rigorously prohibited by law: and innumerable instances of the incidence of English law in the same matter might be quoted. Early in the thirteenth century the many manorial watermills scattered through the country came under the jurisdiction of the Lord High Admiral—perhaps the last authority the rural miller would ever expect to find supervising his doings. This magnate having control over matters relating to the navigation of rivers, was empowered to survey and order the removal of any mills that impeded streams or injured harbours. The first English law on the subject entered in "the Black Book of the Admiralty," about the year 1360, but dating back to about 1216, enacts:—

Liber Niger Admiralitatis, No. C. xxxiv.

Item, de tous ceulx qui soustiennent aucuns molyns sur eaue salee et lestremes diceulx molins cueillent, a eulx sablon pierres ou terre par la quelle cause le port pres diceulx molins soit empire ou en point destre pire: et se aucun est en ce endite et convicte par douze issera mandemant le admiral au visconte par vertu de lentendance quil doit a ladmiral pour abatre iceulx molins et le seigneur diceulx molins fera fin au roy.

Let inquiry be made of all those who set up mills on salt water whether the streams of the said mills gather sand, stones, or earth whereby the port near the said mills is impaired and in danger to be spoiled; and if any one is convicted thereof by twelve men, the Admiral shall send his warrant to the sheriff that (by reason of the obedience he oweth to the Admiral) he pull down the said mills; and the owners thereof shall be fined to the king.

Ibid., No. D. xxvi.

Item, soit enquis de tous ceulx qui soustiennent sur les gros stremes et chanelles de havens ou ports weres kedylles blyndestakes watermylles ou autres instruments en aneantance des ports par les quelz nefz ou bateau ait este periz ou homme mort.

Let inquiry be made of all those who maintain on the great streams and channels of havens or ports, weirs, kiddels, blindstakes, watermills, or other instruments, to the injury of the ports, by which ships and boats may have perished, or lives been lost.

Ibid., No. E. vii.

Inquiratur si quis in grossis rivis levavit molendina kydellos seu alia instrumenta quæ navigantibus sen navibus communiter sunt nocumenta.

Let inquiry be made if any one shall have erected on the great rivers mills, kiddels, or other instruments, whereby sailors or vessels may commonly be injured.

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1. Causeways, &c.

The wondering miller may have thought it somewhat out of the way for the Lord High Admiral to step, as it were, off the breezy ocean into his little mill on river or creek: but this official had by this time good reason to complain of the trade freely blocking up rivers with wheels and dams, and entering upon a kind of enterprise which threatened to put a stop to what should have been regarded as the most valuable revenue of the craft, viz., inland navigation; and many a mill of the period was, no doubt, very properly swept away at the bidding of the Lord Admiral on the formal finding of a jury that navigation was thus hindered. The Admiralty laws on this subject were continued by statutes, 45 Edward III. c. 2; 1 Henry IV. c. 12; 12 Edward IV. c. 7; and remained in force till the middle of the fifteenth century.*

* The ancient ballad, *The Miller and the King's Daughter*, seems to depict the mill located upon the banks of a navigable river or near the sea on which "ships" were sailing:— Musarum Deliciæ, 1656.

There were two sisters went a playing,
With a hie downe, downe a downa,
To see their father's ships a sayling,
With a hie downe, downe a downa.

The elder pushes the younger into the water: her dead body "stopping hard by a miller's mill:"—

It was the bodye of a fair ladye
Came swimming down the stream.
The miller runne hastilie down the cliffe
And so he tooke her withoute her lyfe.
What did he do with her fayre bodye?
He made it a case for his melodye.
What did he do with her breast bone?
He made him a violl to play upon.
What did he do with her veynes so blue?
He made him strings to his violl thereto.
Then bespake the treble string—
"Oh, yonder is my father the king!"
Then bespake the second string—
"And yond my mother the queen!"
Then bespake the strings all three—
"And yond the sister who drownéd me!"
Nowe paye the miller for his payne
With a hie downe, downe a downa,
And let him begone in the devil's name,
With a hie downe, downe a downa.

Notes and Queries, 1 Sec., 5 vol., 591.

This treatment seems a somewhat inconsequent sequel to the worthy miller's recovery of the body of the damsel, and his devotion to the violin which in his hands

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Still it was not always actually by the action of the Admiral that obstructive mills were removed from navigable streams. At Shrewsbury, in 1268, the burgesses took stringent private action against the Abbot of St. Peter's, who had built on the Severn

Harvington Weir and Mill.—*Photo. by J. H. Crabtree, Birmingham.*

Text: Vol. IV. a mill which impeded navigation; and without resort to law the parties came to terms, and the obstruction was duly removed.

expressed so momentous a revelation; but it is quite in consonance with the unjust treatment usually meted out to the medieval milling craft. The ballad (only a portion of which we have quoted) was rescued from oblivion, or as some say, was written by the Rev. J. Smith, D.D., chaplain to the Earl of Cleveland, 1650. It is in much the same strain as *The Twa Sisters*, also popular in England about the year 1650: a jealous sister taking a younger one to the mill by the shore and casting her into the sea:—

Songs and Ballads: Jamieson, 1806.

She's ta'en her by the milk-white hand,
Binnōrie, O Binnōne!
And led her down to yon sea strand,
By the bonny mill dam o' Binnōne.

. . . . . .

Sometimes she sank, sometimes she swam,
Binnōrie, O Binnōne!
Till she came to the mouth of yon mill dam,
The bonny mill dam o' Binnōne.

X. THE MODERN WATERMILL.

1. Causeways, &c.

By the reign of Edward III., the making of kiddles and causeways had apparently extended to exceedingly mischievous proportions, and in 1352 an Act was passed directing all "causeys" set up since the time of Edward I. to be forthwith destroyed—an enactment which would certainly prove a serious drawback to milling. Mills were increasing in size: "great broad stones" were all the rage: causeways for heading up the entire upper reaches of a river, and providing a heavier flow through the mill-race, were in universal demand. The character of these causeways, and their success in effectually blocking up a stream, may be seen even yet at Chester, where the great curved stone structure in the bed of the river Dee, raising the level of the water behind it three or four feet for the purpose of driving Chester mills, has existed since almost the period of Domesday; and, despite many a struggle, and more than one Parliamentary order to destroy it, remains to the present time: though the recent closing of the historic Dee mills seems to portend at last the abolition of the ancient obstruction.* The Act of 1352 was intended to affect only dams recently erected: all structures representing ancient vested interests being left undisturbed. In 1399 another Act, reciting and confirming that of 1352, directed that weirs and causeways should be surveyed "to the end that those which have been much enhanced [raised] since their erection, shall be amended to the old time level." Whence it appears that even those millers whose causeways had not been condemned by the old law had not been content with exemption, but had raised the dams higher to secure still heavier flows, and drive still larger stones.

Text: Vol. IV.

In 1422 the Lord Admiral was relieved of his milling functions; and possibly it was with a sense

* The causeway at Chester, views of which appear in a later volume, was perhaps the largest in the kingdom. An instance of a small one occurs in the mill of Thomas del Booth. Lancashire, 1370, who leaves 30s. in one case, and 20s. in another, to make bridges and causeways at his mills. Baines' Lanc.: II., 198.

X. THE MODERN WATERMILL.

1. Causeways, &c.

of relief that the craft learned that causeways were to be subjected for the future to supervision by the less warlike, but equally incongruous authority, the Commissioners of Sewers. This body, however, did not supervise dams and mills without considerable criticism and opposition from mill owners: an order issued by them in 1609 directing the destruction of the Dee causeway affording a conspicuous instance of the manner in which at times their orders were popularly opposed and judicially overruled: as described in our account of Dee mills. The commissioners, who comprised a number of local boards consisting of prominent landowners or other persons of local importance, continued their supervision of navigable rivers under confirmatory Acts of 4 Henry VII.; 6 and 25 Henry VIII.; 3 and 4 Edward VI.; 1 Mary; 13 Elizabeth; 3 and 7 James I.; and seem to have been finally abolished by the Repeal Acts of 3 George IV. c. 41; 5 George IV. c. 74.

Text: Vol. IV.

Numerous other causes of dispute than hindrance to navigation arose from the erection of dams and kiddles; such as the preventing fish passing up rivers, overflowing of adjacent lands, intercepting or diminishing flows to mills on the lower reaches of rivers. Of such annoyances, from the time when King John prohibited the erection of kiddles on the Thames to even the present century, abundant evidences which might be cited would prove but a mere needless reduplication of facts of no present interest. So numerous were these disputes, in fact, that we find the milling engineer Sutcliffe, at the beginning of the present century, emphatically declaring them to work havoc among the watermillers of the country:—

Designing and Building Water Corn Mills, 1816.

In consequence of so many watermills, the country is never free from litigations and vexatious lawsuits respecting erecting, repairing, or raising weirs, by which the peace and harmony of neighbours and friends are often destroyed. Some few years ago the annual expense of water causes and arbitrations in consequence of them, in

1. Causeways, &c.

the counties of York and Lancaster alone, was estimated at £10,000; and should trade revive, it is probable that in a few years they will exceed this sum, unless some such plan as I recommend is adopted. [The plan was to place on the mill a strong copper plate recording the exact height of the water, so that if the weir were taken down in a flood the plate would, by its position and record, determine what height the new weir should be, and prevent the miller building it too high, or the neighbouring landowner demanding it to be built too low.] Had this precaution been observed fifty years ago, it would have prevented lawsuits that have since that time cost near half the value of all the watermills in the kingdom at that period.

These assertions were not mere random exaggerations; water rights were of so considerably greater value in those days than in the present that it is now almost impossible to gauge the bitterness with which disputes regarding them were conducted, or the unyielding attitude assumed by claimants to such rights. In one of the latest cases of moment we are able to call to mind, the owner of a mill on the Team, a tributary of the Dove, Staffordshire, becoming involved in a dispute as to his water rights with a neighbouring farmer, the matter, after much bickering, drifted as usual into the law courts; when, after heavy litigation, the affair was referred to an arbitrator; the latter, in January 1815, giving an award generally in favour of the farmer, who, as the miller was by this time ruined, had of course to pay the costs.

To the diversion of water courses driving mills, it is unnecessary here to refer at any length. An early typical dispute was heard in 1302 at Launceton Assizes, when Alan Bloyan and Joan his wife were charged with diverting a water course that turned a mill in which these persons were co-partners with John de Teabron and Joan his wife. Some dispute had arisen between the parties: perhaps the two Joans could not agree. At all events Alan and his Joan seceded, and turned off the stream so that John and his Joan could not use it, "and the mill could not grind as heretofore;" by which John suffered damage to the extent of 13s. 4d.; the Court promptly

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1. Causeways, &c.

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ordering the water to be turned back into its proper course at the expense of Alan, who by the way never thought fit to put in an appearance at the hearing. Since that day records of complaints and actions regarding such actual or alleged injury are innumerable, some two or three characteristic instances incidentally appearing in our records of medieval feudal mills.

2. Uniform Type.

2. Regarding the modern watermill itself very little, as has been already observed, can be stated in a non-technical work such as the present. Almost from its very inception its simple mechanism was complete. As Vitruvius left it, so practically it continued; as Saxons of Domesday worked it, so essentially it remained till our own day. Of the medieval watermills depicted in early miniatures, the antiquary Strutt remarks: "The watermills are delineated like square weather-boarded houses, and the water-wheel is discovered at one end, sometimes with and sometimes without a penthouse or covering over the top of it. We are by no means able to make out further discoveries of the works within, but so very simple is the construction of the wheels and the motion of the present mills. that there

Hord. Ang. Cyn.: 1776, II. 14.

Harl. MSS., 5256.

From a Sixteenth Century MS.

is very little room left to doubt their being anciently erected upon the self-same plan." To the illustrations of such mills we have already given from MSS. of the twelfth, thirteenth, fourteenth, and fifteenth centuries, may here be added one from a French MS. dated 1597, depicting, as well as a windmill, a watermill of the usual Roman type, beyond a bridge, towards which a man on an ass is carrying a sack of corn to be ground.

Text: II. vii

The penthouse or shed covering the water-wheel, mentioned by Strutt, has long been discarded, but examples may still be found of wheels enclosed under a roof. At Strata Florida, South Wales, is a mill in a long, low, cottage-like structure, divided into three parts, one comprising a miller's domicile, another the mill hurst, and a third a house for the water-wheel. The Saxon mill at Guy's Cliff, Warwickshire, has its water-wheel enclosed in an arch within the building. An exceedingly curious case of a covered water-wheel occurs at Tycroes, in Anglesea, where, in a combined watermill and windmill—a rather unusual combination—the water-wheel is completely enclosed within the basement of the tower. The latter is built quite across a race of water fed from an adjoining dam; the current as it passes through the mill turning an undershot wheel of about 14 feet diameter, shut as stated within the lowest storey of the mill. There are not, as might be thought, two separate mills in the structure, the water-wheel being used to drive the stones only when wind fails. This is effected by a cog on the shaft of the water-wheel driving a pinion attached to the lower end of an upright shaft, which ascends to the top of the interior of the mill: where it is geared as required to drive the stones when the sails are at rest. From the exterior this curious structure resembles an ordinary windmill standing on the edge of a dam or pool. It was first built as a

Text: Domesday Mills.

X. THE MODERN WATERMILL.

2. Uniform Type.

combined mill about a century ago, and being burned down after working about sixty years satisfactorily, was restored in its original form; and still is considered by the owner to constitute a valuable improvement upon either the ordinary wind or water mill.

In the sixteenth century we gain some idea of the watermills of the period from the remarks of Justice

On the Shannon.

Fitzherbert regarding the value of mills erected on ancestral estates :—

Boke of Surveying, 1538.

The lord of a manor may set upon the great rivers corn mills that be called ground mills, because the overside of the head-sill lieth even with the overside of the ground in the bottom of the water. Commonly these mills be not set upon the streams of the great rivers, but a great part of the water is conveyed out of the great stream by a mill-fleume, made with man's hands, to a certain place where wise men think the mill most convenient to be set; the said water to be holden up and brought to the mill by reason of setting a weir overthwart the said stream, made of trousse timber or stone, or both: and when it is past the mill, with a sufficient fall of the water that it stand not in back water, to return into the river

X. THE MODERN WATERMILL.

2. Uniform Type.

again. In many places the said mills be set on one side of the great river.

Also there be two manner of watermills—a brast mill and an overshot mill: and both these be set and go most commonly upon small brooks and upon great pools and meres. They have always a broad bow—a foot broad and more—and the ladles be always shrouded with compost boards on both sides to hold in the water, and then they be called buckets. The miller must draw his water according to his buckets, that they may be always full and no more: for the longer that they hold the water and the better they be. Mills upon great rivers that be broad, heavy, and weighty, must needs have two great thick hoops of iron, four inches broad and one inch thick and eight or nine inches between the sides, set on both ends of the shaft. . . . Insomuch as there is great profit to the lords in the making these mills, and the most rent is raised on so little ground, oftentimes for the want of the seed of discretion and experience of good making there be many defaults made in them. . . .

A man can make no surer advantage to himself than to make better his old inheritance, not by heightening or increasing the rents of his tenants, but only in mending and making better his lands, and in making watermills, windmills, horsemills, or such other. . . . There be many manner of mills, as corn and wind and horsemills, and querns that go with hand: fulling mills, scythe mills, cutter mills, smith mills, and all others as the wheel goeth by drift of water. And [even] though they be not mills properly to grind corn, yet it is a profit to the lord, the which a surveyor may not forget to put in his book, and to butt and bound as they lie; and who be the farmers, and what rent they pay.

The interior of a watermill at about the date Fitzherbert wrote this disquisition, is shown by the next illustration, in which the date 1603 may be perceived carved on the stone frame in the foreground. Though a Swiss establishment, it illustrates perfectly well the interior of the usual watermill of the period.

During medieval ages many subsidiary details for more perfect operation of the grinding have from time to time been introduced, but these, while adding to the efficiency of the mill, have in no wise so altered its character as to come within the scope of our review of the history of the mill. The ancient undershot water-wheel has been succeeded by the overshot and the breast wheel; which, however, have not superseded the more primitive type; the stage of finality in this respect nowhere being better demonstrated than

X. THE MODERN WATERMILL.

2. Uniform Type.

at Colwyn Bay mill, where a race conveyed in a trough down the hillside turns an overshot wheel driving

Aaran (Switzerland) Interior, 1603.

one pair of stones; and afterwards is collected in another trough at a lower level to turn an undershot wheel driving another pair of stones placed in another structure attached to the mill. The natural stream which once leisurely drove water-wheels as though at its own freedom and will has been confined in races or behind causeways, and forced to flow at all times and seasons; but still without affecting the mechanism of the wheel or the mill. Gearing ratios have been altered to produce varying rates of working, though

X. THE MODERN WATERMILL.

2. Uniform Type.

the principles of the gear itself practically remain unchanged. Improved systems of building, balancing, and grooving the stones have left the latter in their relative arrangement, their motion and action, precisely as they originally were. And while the medieval miller was content merely to grind the grain, and leave its bolting and dressing to the care of the baker, the modern miller finds the separation and grading of the meal one of his foremost duties; yet his stone-grinding watermill, despite its adjuncts of bolters, purifiers, and dressers, has remained, in every essential feature, absolutely unaltered. Apart from such incidental improvements, appertaining solely to a study of the engineering aspects of milling, the Roman type of watermill has thus, from its earliest period, been so far as possible in accordance with the times, a perfect machine of its kind; contentedly for ages accepted as a contrivance which embodied, if indeed it did not limit, the utmost resources and abilities of corn millers: till, finally—following inevitably in the vanishing train of obsolete saddle-stones, querns, and cattle mills—the stone-grinding watermill, raised by modern engineering skill to its highest stage of efficiency, has been completely disranked from among the premier mills of the world by the steam-driven roller mill which now dominates the art. Numbers of watermills nevertheless survive, but are of but secondary status in the national industry, save in those instances alone in which their ancient stones have been replaced by rollers.

3. Evans' Improvements.

3. The mill of the last century, that by which, despite its imperfections, the production of flour rose from one of the smallest to one of the greatest and most valuable industries of the world, was essentially a structure of few parts, whether driven by water or wind, and its processes were exceedingly simple. The wheat, cleaned by a rude machine consisting of a couple of

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3. Evans' Improvements.

cylinders or screens and an air blast, passed through a pair of millstones running very low, *i.e.* close together, in order that the greatest amount of flour might be produced at one grinding. The meal was then bolted, and the tailings, consisting of bran, middlings, and adherent flour, again sifted and reground. It seems probable that the miller of the time had a fair notion of the high grade of flour ground from middlings, but no systematic method of procedure for its production was adopted.

The ingenious Oliver Evans (1756–1819), whose inventive genius and practical ability were but feebly requited by pecuniary success, was the first to materially improve the milling processes of the last century. His simple contrivances, some of which in almost the same form are employed to-day, introduced into milling the feature that has done so much for its prosperity, viz., an automatic handling of the grain or flour by the motive power of the mill; and so reducing to the smallest possible limit the enormous demand formerly made on the bodily strength of the miller, by whose labour almost the whole of the material was daily carried up or down the building. The contrivances by which Evans effected this vast improvement have wrought an immense and salutary change in the conditions under which the miller labours; and some slight description of their nature seems therefore germane to our subject.

The chief inventions of Evans were the elevator, the conveyer, the drill, the descender, and the hopper-boy. "By means of these machines may be performed every necessary movement of the grain and meal from one part of the mill to another through all the various operations, from the time the grain is emptied from the waggoner's bag, or from the measure on board ship, until it be completely manufactured into flour, either superfine or of other qualities, and separated ready for

Young Millwright and Miller's Guide: 13th Edit.: Philadelphia.

3. Evans' Improvements.

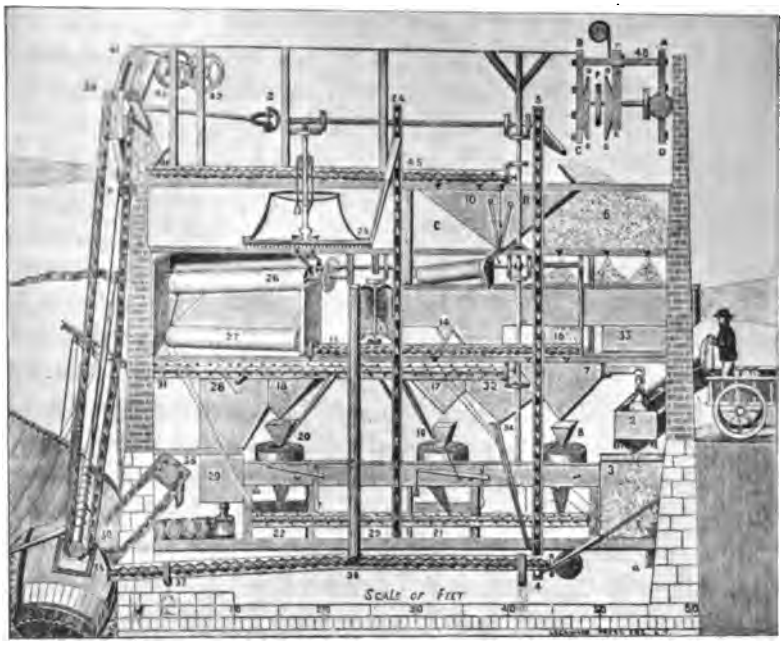
packing into barrels. All which is performed solely by the force of water entirely without the aid of manual labour, except to set different machines in motion. This lessens the labour and expense of attendance on flour mills by fully one-half." The most important and useful of his machines, the elevator and the conveyer, are too well known to need description. The elevator was an endless band, with cups attached to its outside: the conveyer consisted, for grain, of two helicoidal surfaces on a revolving shaft, and for meal of a shaft with a series of small wooden blades set spirally and at an angle, which were called "flights." In both cases the contrivance was enclosed in a box, and turned as a screw. The hopper-boy, now no longer in use, consisted of an arm revolving horizontally about an axis, with flights; this first spread the warm meal as it came from the millstones, and then collected it to the centre, where it fell through sprouts to the bolts on the floor below. The drill was an endless band with rakes or blades for moving the meal horizontally; and the descender was an arrangement for the same purpose, but without the application of power; the weight of the material being relied on to produce the necessary motion. Among the benefits of these machines Evans enumerates the following: "A better preparation of the meal for bolting, for packing and preserving, is obtained, and in much less time than usual: the work of cleaning the grain, elevating and mixing various parts to be again treated, is effected in one operation; there is considerable saving in meal; there is economy of space; the work is performed more rapidly; the elevating done with less power, while preventing sudden variations of speed in the stones; and finally, there is a great saving in cost of attendance, one operative turning out twenty barrels of flour instead of ten as by the old method, and a forty barrel mill requiring in all only two men instead of four men and

U.S. Govt. Report on Agriculture, 1883.

X. THE MODERN WATERMILL.

3. Evans' Improvements.

a boy. The machines are economical and durable, as their motion is generally slow." The annexed illustration from *The Young Millwright* was intended by Evans not as a plan of any particular mill, but simply as a diagram showing at one view the combinations and processes of his machines in what he regarded as an ideal mill.



Oliver Evans' Mill, about 1790.

Liverpool Advertiser, Jan. 31, 1791.

In 1791 these marvellous inventions were announced to the millers of Liverpool with very modified approval. "Mr. Oliver Evans, an ingenious American, has invented a model of a flour mill upon a curious construction which, without the assistance of manual labour, first conveys the grain deposited to be ground to the upper floor, where it is cleaned. Thence it descends to the hopper, and after being ground in the usual way, the flour is conveyed to the upper floor, where, by a

3. Evans' Improvements.

simple and ingenious contrivance, it is spread, cooled, and gradually made to pass to the boulting hopper. The whole contrivance does the greatest honour to the inventor, and is likely to be of some pecuniary advantage to him, as he has obtained from Congress an exclusive right to the profits of the invention for fourteen years. A number of mills have been already constructed upon this plan, which are found to answer perfectly in practice. To make inanimate nature thus yield to the power of man's inventive faculties what otherwise manual labour would be obliged to effect, must be of the greatest advantage to a young country where hands are wanted." Evidently for the old country, where there were too many hands, the Liverpool editor saw no particular merit in the labour-saving contrivances of Evans, which, however, were soon in operation on the busy banks of the Mersey as elsewhere.

The efficiency of the mills in the time of Evans may be gathered from the table given by him as the result of his own experiments :—

Quality of Grain.	Weight per Bushel.	Screenings and Loss in Grinding.	Breadstuff Shorts and Bran.	Ship Stuff.	Tail Flour and Middlings.	Superfine Flour.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
White wheat, clean . . .	59 50	1.72	13.10	2.50	3.68	38.50
White wheat, well cleaned	59.00	1.00	12.00	2.12	3.65	40.23
Red wheat, not well cleaned	60.00	7.57	8.52	1.61	3.60	38.76
White wheat, mixed with green garlic	61.00	3.68	9.54	2.40	5.6	39.70
White wheat, very clean .	56.00	5.48	7.86	1.85	5.00	35.81
White wheat, with some cockle and light grains	59.25	6.79	11.33	1.47	4.40	35.26

Thus from 59 lbs. of well cleaned white wheat 40.23 lbs. of superfine flour were produced. This is an exceptionally good result, and was probably far

X. THE MODERN WATERMILL.

above the average. The yield, in other words, was 196 lbs. for every 287.45 lbs. of wheat; or a loss of 91.45 lbs.; the quality of the flour being probably considerably inferior to that of the present day.

4. Caustic Criticism.

4. At the early part of the present century the water miller was by no means free from that obloquy

Aber. North Wales.

which in one form or other had dogged his craft, from the days of Chaucer, if not from earlier times still. In tracing century by century the fortunes and vicissitudes of the much-maligned miller of old—ideally a man whose placidity of temperament was only equalled by his prosperity and happiness in life: but actually a very hard-working, and often greatly worried, tradesman—we have found much reason to question the popular vote of censure under which at manifest disadvantage in the eyes of his fellow countrymen he so long laboured. In another part of the present work the aspersions which assailed and practically ruined the fair fame of the miller in days gone by are all frankly recorded;

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X. THE MODERN WATERMILL.

4. Caustic Criticism.

while, on the other hand, the frailties from which unhappily some members of the craft of yore were not exempt—deplorable as they were—are equally expounded at length. As in justice bound, of one nor the other we extenuate nothing. Still there is a very good case for the defence, and we have sufficiently set it out to vindicate the ancient craft from very much of the posthumous slander which haunts its venerable memory. At the present moment, however, we are concerned solely with the water miller of the early part of the present century, who, as we say, was not exempt from the traditional liability of the trade to endure the round-set terms of popular abuse; and a jeremiad of the period, from which we propose reproducing an extract, may be taken as a typical illustration of the views and temper of the age with regard to our long-suffering craftsman. It may be premised that numerous pamphlets common at the time regarding high prices, dearths, grinding, and baking, afforded a ready vehicle for the promulgation of erratic views of all kinds upon popular topics, then affecting the public mind with considerable intensity. Much feeling was thrown into discussions of purely economic questions, and personal views of private persons, set forth ad libitum, were hotly pressed on the attention of administrators, as sovereign remedies for the severe distresses under which the nation frequently suffered. It is useless to reproduce these ephemeral outpourings, though a few are necessarily quoted in a later volume in connection with allegations against combined millers and bakers. The caustic critic from whom the following quotation is taken is Sutcliffe, the milling engineer already quoted :—

Designing and Building Watermills : Sutcliffe, 1816.

There is no manufactory of any kind that I know of in which so little improvement has been made for the last thirty years as that of grinding corn; and the reason is obvious. First, those in general that have been employed in it have not been men of either family, fortune, or education; hence they have been almost excluded from

4. Caustic Criticism.

the society of the gentleman and the merchant. Add to this that the trade itself has frequently been very unpopular, and those employed in it persecuted when they deserved the greatest encouragement and protection. Second, when want of education, of capital, and a regular association with men of science prevail, improvement will make slow progress: but the clouds of ignorance and prejudice that have governed the unthinking multitude are passing away very fast; and the farmer and the miller will soon rank with the most polished part of the community. There are not two other characters in the kingdom upon which the necessary comforts of life so much depend: and yet there are no two classes of men in the community that have been so much neglected and persecuted by lawless mobs, or had so much of their property taken and wilfully destroyed.

Horning-on-Bure.—*Photo. by P. Jennings, Ashtead.*

I may venture to assert, with the greatest confidence, that there is not one miller in twenty that knows anything about grinding well. The general estimate of the most experienced and intelligent master millers is that there is 2s. per qr. difference between grinding well, and in but a middling way; and more than 4s. per qr. difference between grinding very well and ill. Grinding and dressing well is of much more importance to the master miller and the public than men in general are aware of. And it is truly surprising that it should have been so little attended to, considering the high price of grain for so long a time. There is no manufactory in the kingdom that is of half that consequence to the public as that of grinding corn;

Cleeve, near Goring.*—*Photo. by A. G. Potter, Ludgate Hill.*

yet is there none that stands so much in need of improvement. What an invaluable source of wealth lies yet unexplored in the drying and grinding of grain! The prince, the peer, and the peasant, are equally interested in it.

Outspoken criticism of this kind must have proved somewhat depressing to the struggling old yeoman millers, who knew so little, yet did their best. Still Tennyson presents us with so charming an attempt at a portraiture of the much-abused old miller that nowadays — to adopt the words of the poet — the memory of even Sutcliffe's diatribes, "scarce make one sad":—

I see the wealthy miller yet,
His double chin, his portly size;
And who that knew him could forget
The busy wrinkles round his eyes?
The slow, wise smile that round about
His dusty forehead drily curled,
Seemed half within and half without,
And full of dealings with the world.

In yonder chair I see him sit,
Three fingers round the old silver cup—
I see his grey eyes twinkle yet
At his own jest: grey eyes lit up
With summer lightnings of a soul
So full of summer warmth, so glad,
So healthy, sound, and clean and whole,
His memory scarce can make me sad.

—*The Miller's Daughter.*

* Cleeve, one of the oldest flour mills on the Thames, is now a private residence, with the old wharf laid out as a lawn.

X.
THE MODERN WATERMILL.

5. Decadence.

5. "The never-failing brook, the busy mill,
The decent church that topped the neighbouring hill,'

—these grateful adjuncts to British scenery, familiar objects throughout the shires for many a generation, are rapidly being depleted of the fond emblem of brisk life and prosperity, the once "busy mill": edged out of existence by the giant stride and power of the modern roller mill. Vast numbers of the venerable rustic structures have succumbed to ruin; many have fallen from their high estate as grinders of flour to that of makers of cattle food; and though others, fitted with rollers and auxiliary steam power, still bravely face the world of competition, still not a few, constantly appearing in the market, change hands at prices testifying but too palpably to their generally diminished value as compared with modern mills near the coast, and in direct communication with the trunk railway lines of the kingdom. This year, for example,

the watermill of Kettleburgh, Suffolk, fitted with a new waterwheel, driving three pair of stones, together with a residence attached, was sold by auction for the sum of £300; and in the Chancery Division recently, it was indeed stated by a receiver in bankruptcy that there was a season for such sales

Kettleburgh, Suffolk.

—the month of May. Among the regrets with which is met this obliteration of rural watermills from scenes they have so long adorned, and sequestered spots they have so intimately benefited, perhaps none may here be more aptly quoted than those of Mr. J. Jardine in a thoughtful little peroration concluding an appreciative archæological paper on the old corn mills of Northumberland—such a paper as we should desire to see locally produced upon the district mills of every archæological centre in the kingdom :—

"The mills were giving out their cheerful click-clack; the busy ripple of the waters in the lades fell merrily on the ears of the miller and his assistant. Trans. Hawick Arch. Soc., 1896.

X. THE MODERN WATERMILL.

5. Decadence.

Now, in a great many cases, they are gone; the sound of the old mill-wheel is hushed; the dusty miller no longer casts his eyes along the grassy banks of the dam to look at the flowers dotting the banks of the little stream. The mills and men have served their day and generation, and a new order of things is upon us. And yet, glancing back from amidst the bustle and excitement of the present day, one cannot help thinking that life has lost much of the happiness of those

Old Nant Mill, Beddgelert.—*Photo. by H. Forrest.*

good old days. We can think that we almost hear the whistle of the farmer's boy as he drove up to disturb the miller, and get a word for coming at an untimely hour; for the miller, like the blacksmith, was generally an independent spirit. The old corn-millers spent their days amongst peace and plenty, and the memory of their simple lives should be cherished." The picturesque structures wherein their placid lives were passed, the retired nooks where—

"Echo in her airy round
Over river, rock, and hill,
Cannot catch a single sound
Save the clack of yonder mill,"

5. Decadence.

—these memorials of a busy past may here and there occasionally attract the eye of the tourist, or absorb for a moment the attention of the practical-minded miller of the present day; but beyond such

Harvington, Worcester.—*Photo. by J. H. Crabtree, Birmingham.*

silent recognitions of a once flourishing industry thus quietly but surely passing away, the change seems to progress to its close unnoticed, unless by those who may be sufferers by it. Still, as will amply be shown in another volume, abundant materials exist for enriching local archæology by the compilation of those ancient records of which perhaps all (except the most modern) watermills are possessed; or by the gathering together of those isolated fragments of traditions, folk-lore, literary or artistic mementoes which in many scattered directions are to be found associated with the water-

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5. Decadence.

mills of the kingdom in their days of vitality and prosperity. Beyond the typical ancient mills, the history of which from a national point of view we have ourselves endeavoured to trace, we are aware of none in the kingdom whose vicissitudes of fortune have adequately—nay in any appreciable degree—been recorded, unless perhaps the mills of the Baxters' Company of Glasgow;—surely an oversight for which local archæologists will in due time make cordial amends. Very recently the trade journals, *Milling* and *The Miller*, have followed in the train of those one or two newspapers which have published short antiquarian notes upon mills; yet these are but a miscellany of disjointed items from a mass of materials awaiting acceptance or rejection by the milling archæologist.*

Across the Atlantic, where the rapid evolution of modern milling has early antiquated both watermills and windmills, of no very great age, few of the ready pens of even the most practical of the milling press of the States—*The North-Western Miller*, &c.—omit to record from month to month some characteristic trait of the primitive milling resources of the country, in connection with the decayed or decaying structures. The example suggested a few years ago in this respect by Cullen Bryant has been worthily pursued, and seems likely in the future to rescue many an interesting record from oblivion.

Bryant frequently evinces a sympathetic appreciation of the attractions of the old mills to lovers of the

Ord. Gazetteer, Scot.: 1885, II., 328.

* The *Glasgow Herald* (Aug. 6, 1898), adds to the manifold traditions of the craft the grim story of the ruin of Spedlin's Tower, Annandale, haunted by the ghost of one Porteous, a local watermiller, who, being immured in its dungeon by Sir A. Jardine, about 1680, was unfortunately forgotten and left to perish. "Sir Alexander being called away to Edinburgh, rode off with the key in his pocket, and never thought of his prisoner till he reached the city; then he sent back, but all too late, for the miller had died of hunger after gnawing his hands and his feet." Only a Bible chained on the dungeon steps sufficed to lay the wraith of the unhappy miller; but the incident, which in these days would certainly enhance the value of the ancestral tower, then, on the contrary, led to its depreciation and ruin.

X. THE MODERN WATERMILL.

picturesque or antique, as well as to even the modern man of business whose enterprise has dimmed their ancient local glories. One or two of his eloquent laudations we propose to reproduce, but in passing may, first, appropriately remember the curious history of the Chesapeake watermill at Wickham, Hampshire.

5. Decadence.

6. The war between England and America, towards the close of the reign of George III., was marked by many a sharp naval encounter, and perhaps that in which the *Chesapeake* was engaged and defeated by the *Shannon* in 1813 was one of the most remarkable. "The *Shannon* mounted thirty-eight guns and the American frigate the same number, but was superior in number of her crew." Captain Brooke of the *Shannon* was anxious to engage Commodore Rogers, who had been distinguishing himself by capturing a number of British vessels; and not being able to meet with him, challenged Captain Lawrence of the frigate *Chesapeake*, then in Boston harbour, to a naval duel between the vessels.*

6. The Chesapeake.

* How courteous and obliging the old sea dog was about it! "As the *Chesapeake* now appears ready for sea," wrote he, "I request you will do me the favour to meet the *Shannon*, with her, ship to ship, to try the fortune of our respective flags. The *Shannon* mounts twenty-four guns on her broadside, and one light boat gun, eighteen pounders on her main deck, and thirty-two pounder carronades on her quarter-deck, and is manned with a complement of three hundred men and boys. I entreat you, sir, not to imagine that I am urged by mere personal vanity to the wish of meeting the *Chesapeake*, or that I depend only on your personal ambition for your acceding to this invitation. We have both nobler motives. Favour me with a speedy reply. We are short of provisions and water, and cannot stay here long." This obliging communication duly despatched, the *Shannon* stood in close to Boston lighthouse and lay to. Lawrence, to whom the challenge was sent, had been lately captain of the *Hornet*—the *Alabama* of its time—and not long before had challenged to a duel a British ship acting as guard to a vessel with half a million sterling on board, stranded at St. Salvador. This challenge under the circumstances had been declined, and Brooke seems to have thought it incumbent upon him to vindicate the honour of Britain by entreating Lawrence in his new frigate to fight *him*. At midday, 1st of June 1813, the *Chesapeake* was under weigh, and sailed down the harbour, accompanied by a number of pleasure boats filled with sightseers. The *Shannon's* foretopsail was laid aback that the *Chesapeake* might overtake her, and the latter, bearing at the fore a large white flag inscribed "Free Trade and Sailor's Rights," hauled up within 200 yards of the *Shannon's* weather beam, and gave three hearty cheers: the while, hurrahs came ringing over the bright summer sea from the *Shannon* as she beat to quarters. As in some gala scene the vessels passed within a stone's throw of each other. The battle began at half-past five, and was over in fifteen minutes. "After two or three broadsides had been exchanged, Captain

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6. The Chesapeake.

The frigate was captured and sent first to Halifax and thence to England, where she lay up from 1814 to 1820. In the latter year she was sold for breaking up to John Prior, miller of Wickham, who thereupon demolished his old mill and erected in its place, from

Chesapeake Mill, Wickham.—*Photo. by C. H. Grant.*

the timbers of the ship, the structure still to be seen in the Hampshire village. The deck beams, 32 feet long and 18 inches square, were placed almost un-

Brooke gave orders to board. His men rushed on deck, and though desperately opposed, carried everything before them. In fifteen minutes from the commencement of the action the American flag was hauled down, and the ships immediately sailed away together as if they had only exchanged a friendly salute." But on the decks of the *Chesapeake* lay the brave Lawrence with 205 of his gallant crew killed and wounded, while on the *Shannon* were eighty-four. Captain Brooke took the vessels to Halifax, where Lawrence was buried with the honours of war; but shortly after his body was exhumed at the request of the American Government and conveyed to Boston; and being delivered to them was there interred with great solemnity. Brooke received a baronetcy. "An American Court of Inquiry ascribed the misfortune in a great measure to the misconduct and cowardice of a black bugleman who, from fright, failed to call up the crew of the *Chesapeake* at the proper moment to repel the boarders," while the fall of Lawrence and most of his officers in the first rush had a great deal to do with the speedy close of the conflict.—*England's Battles* and Knight's *History of England.*

X. THE MODERN WATERMILL.

altered in the floors of the structure, the purlins of the deck, about 12 feet long, being used for joists, partition brattices, &c.; many of these timbers yet bearing the marks of the *Shannon's* grape-shot, which at the present day can be seen deeply buried in the pitch-pine. "This building should be a shrine to every American pilgrim landing on Britain's shores," observes a recent American journalist; "the swords that were drawn between the mother country and her sons are here beaten into ploughshares; and may it ever remain so!" Thus in the peaceful rôle of a flour mill the brave old *Chesapeake* lingers strong in the memory, as the Hampshire miller directs the grades, and treads the shotted quarter-deck above the splashing water-wheel.

6. The Chesapeake.

7. Various relics of the watermills in which, prior to the days of Oliver Evans, the vast present grinding trade of the States had its birth, still remain scattered in sequestered nooks near the waterways of the New World. Cullen Bryant describes some of the almost forgotten places with considerable enthusiasm:—

7. American Relics.

What is there in an old mill by a brook that fascinates so quickly the eye of an artist and the heart of a poet? Long before Rogers told us of his earnest wish— Pict. America, 1872, I., 220.

> "Mine be a cot beside a hill;
> A beehive's hum to soothe my ear;
> A willowy brook that turns a mill,
> With many a fall, to linger near"—

all lovers of the picturesque delighted in brook-side mills. Probably no object in Nature or art has been so often drawn and painted. And yet, familiar as we are with old mills nestling quaintly among summer foliage, we always discover a fresh fascination in each new example. Was there ever an artist, who could resist the desire to add a new sketch of a subject of the kind to his portfolio? Whether the mill be one quaint and fantastic by virtue of its decay and ruin, or one that lifts its walls from the river-edge in large pretension, there is always a strange pleasure in this combination of the beautiful and the useful. The brook-side mill affords us almost the only instance of labour that is graceful, picturesque, and seductive. We can imagine a life of labour under the sweet and inspiring conditions of musical waterfalls, shadowy forests, soft airs laden with the perfume of wild flowers, that would possess a certain rich and munificent

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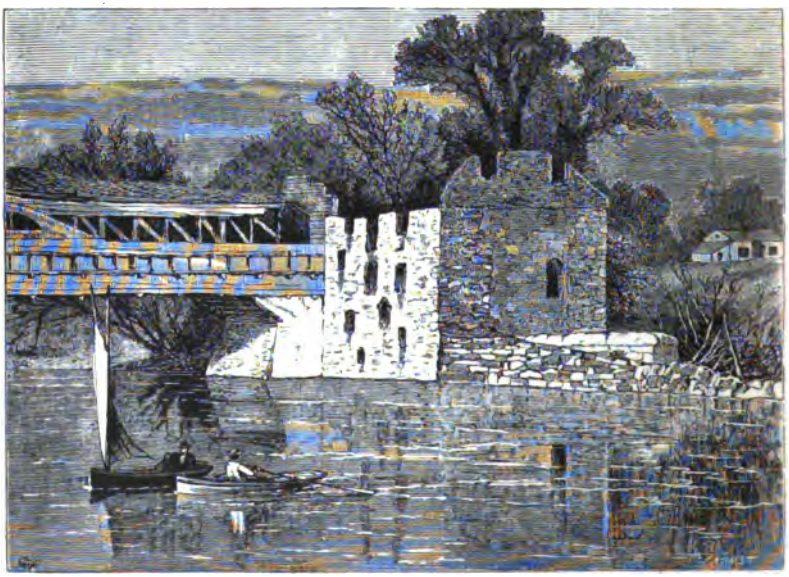
poetic calm. Too often labour mars the landscape it enters, but the mill seems to partake of the spirit of its surroundings; to gain a charm from woods and waters and to give one. This is peculiarly true of the flour factories along the Brandywine; they are of sufficient age to have mellowness and tone; glaring red brick does not enter into their composition; and they greatly vary and brighten the beauty of each woodland picture.

7. American Relics.

Below its picturesque course between the counties of Lancaster and Chester in Pennsylvania the Brandywine drives new gigantic roller mills, the aspect of which is that of strengthful dignity rather than the graceful beauty of which Bryant speaks. Unfortunately the "very old and picturesque flour mills standing not far from the mouth of the river where it



On the Brandywine.

is crossed by a bridge at Delaware city," are not included among the objects of interest depicted by his artist; but "close by the bridge is the ruin of a grist mill, which tradition declares was in operation at the time of the Revolution, and rendered immediate service

Ibid., I. 229.

X. THE MODERN WATERMILL.

7. American Relics.

to the patriotic cause by grinding corn for Washington's army then at Valley Forge. This is an object of no little interest, whether considered historically or with a view to the picturesque."

From this stern old ruin we turn to Cumberland Gap, near the Kentucky border in East Tennessee, where, in "a spot so picturesque, that if money could buy the beauty of nature it would long ago have been transplanted to become the site of a rural palace," is an old mill with an overshot wheel of unusual size "now almost in ruins, but still grinding grain for the neighbourhood."

Ibid., I. 234.

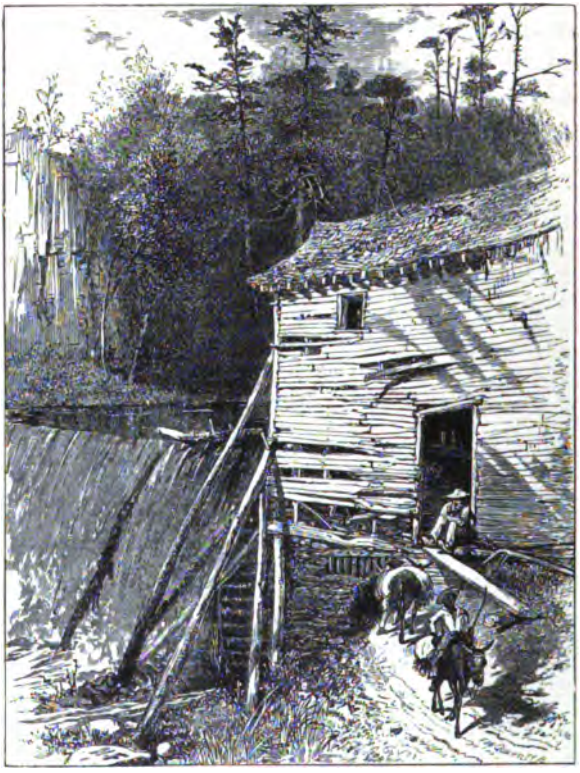
Cumberland Gap, East Tennessee.

X. THE MODERN WATERMILL.

7. American Relics.

Upon the French Broad in North Carolina, a point of interest depicted by the artist is the old mill on Reem's Creek, one of the landmarks of the days when it was a struggle between the Indian and the pale face as to which should hold the land. The creek rises in the Black Mountains and empties into the French Broad, and the mill is historic as being the oldest

Ibid., I. 146.



Reem's Creek, North Carolina.

building on this side of the mountains. It was built there by the settler Reem, from whom its name is derived, "as a sort of fort, something of a store and a little of a mill." A few miles up the stream, on one of the mountain spurs, are corn fields 3500 feet

X. THE MODERN WATERMILL.

higher than the sea, and said to have yielded fifty bushels shelled to the acre. The mill built "as a sort of fort" will be observed to be constructed of timber.

7. American Relics.

In the valley of the Housatonic, within a short distance of Salisbury, at the mouth of the noble mountain gorge known as Sage's Ravine, are the fine old mill and bridge shown in the sketch, the action of the water-wheel being conveyed into the mill from its drum

Ibid., II. 296.

Sage's Ravine, New England.

instead of from a cog-wheel on its axis in the manner most usual.

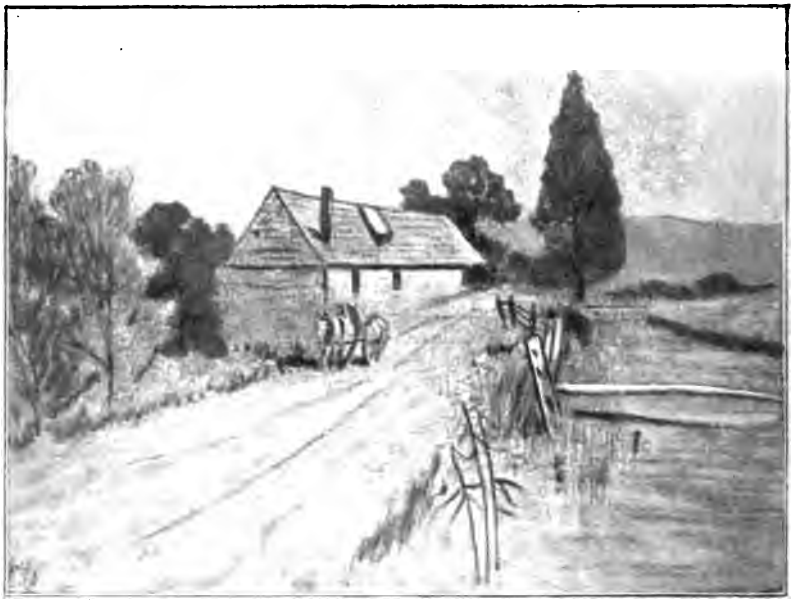
One of Delaware's most picturesque remains of the Swedish settlements is the quaint structure located a

X. THE MODERN WATERMILL.

7. American Relics.

short distance outside Wilmington; peculiarly situated near the top of a hill along Mill Creek, a branch of the Christiana; where for more than two hundred years it has ground the grists of the neighbouring farmers. It stands on a tract of land which was granted by Sir Francis Lovelace in 1669 to Andries Anderson, Seneca Broor, and Gysbert Walraven; in 1683, the whole tract, containing about 1200 acres, belonged to Arnoldus de Lagrange, Gysbert Walraven and Broor Sinnexsen, who divided the property; reserving a tract of eighteen acres of mill land on which, prior to

Millers' Review: Philadelphia, 1895.



Mill Creek, Delaware.

1687, they built a mill. This mill tract is recorded as "layed out for a mill a certain tract of land, situate, lying, being y^e^ south side of a branch of Christiania Creek, commonly called Little Falls Creek." The mill property was bought by John Richardson about 1723, and for a period of 164 years thereafter

X. THE MODERN WATERMILL.

it remained in the possession of him and his descendants. It 1785 it was rebuilt, as indicated by this date roughly cut in a stone above the door.

7. American Relics.

The old "Gulf Mill," dating from 1747, situated on Gulf Creek, near Coushohocken, Montgomery County, Pennsylvania, is considered to be one of the most interesting relics of early milling days in the States. Beside it is erected a memorial stone recording the encampment in the vicinity of Washington's forces, in December 1777, before going into their

Roller Mill, Sept. 1897.

Gulf Creek, Pennsylvania.

historic quarters at Valley Forge. The memorial has been erected by Mr. H. Supplee, owner of the mill; who cherishes among the traditions of the place, that here was ground the corn for the army during its stay in

X. THE MODERN WATERMILL.

the neighbourhood, on the eve of the great struggle for national independence.

7. American Relics.

Another curious mill is that situated near Epperson Springs, Tennessee, where evidences of primitive

Epperson Springs, Tennessee.

simplicity of construction abundantly indicate the considerable antiquity of the structure.

8. Naval Mills.

8. Among the curious mills of modern times reference may here be made to mills erected on board ship and driven by steam. At the outbreak of the Crimean War, it was determined to supply the British troops daily with bread and flour fresh ground from the grain of the surrounding country, by grinding the flour and

8. Naval Mills.

baking upon the spot; and Sir Wm. Fairburn having drawn out plans, the Government purchased two iron screw-steamers, subsequently named the *Bruiser* and the *Ambulance*, which were fitted up with the necessary machinery in less than three months.

The milling machinery, of the ordinary character, with such modifications as were necessary to adapt it to its novel position, was found to answer admirably, grinding in almost all weathers at the rate of 20 bushels or 1120 lbs. of flour per hour; accomplishing this even at a time when the vessel was steaming at 7½ knots or 8½ miles an hour, both the mill and the ship being propelled with the same machinery. The whole of the processes were performed without the aid of manual labour. The wheat stowed in the forehold was automatically raised to the winnower, the hopper, and the mill. Thence the flour was automatically carried to the dresser, where, having been separated into a fine and a coarse quality, it was delivered into sacks. During the time the *Bruiser* was in harbour at Balaklava the daily produce of flour from the mill was about 24,000 lbs., and that from very hard wheat, full of small gravel. The mill never got out of order during the whole period of service in the Black Sea. The results of working on both vessels are given in the official reports at 20 tons of flour ground per day of twenty-four hours. The quantity of flour ground in the three months, 1st January to 1st March 1856, was 1,331,792 lbs., with 358,172 lbs. of bran: the wheat supplied being 1,776,780 lbs. The expenses of working were £2050, or 2s. 4d. per 100 lbs. of wheat ground, or 3s. 1d. per 100 lbs. of flour produced. The total cost of the flour produced was 25s. 3d. per 100 lbs., the wheat costing about 18s. per 100 lbs., and the value of the bran being deducted at 7s. per 100 lbs., or less than 1d. per lb. On one occasion, when the vessel was steaming 6½ knots or 7½ miles per hour, ten sacks of 168 lbs. each of wheat were ground per hour, and the mill was kept in constant work for thirty-five hours, the men being divided into watches of four hours each. The mill worked well throughout, and was found to go more steadily than when the screw was disconnected. When it happened that this latter took place, the engines were kept working at only a quarter of their power for the grinding, as there were only four pair of stones, requiring not more than 20 horse-power out of the whole 80 horse-power of the engines, and they could not therefore run so steadily as when connected with the screw.

Trans. Inst. Mech. Eng.: Paper by Sir W. Fairburn, 1858.

Sir Wm. Fairburn's interesting paper on the subject is accompanied with several technical drawings, fully illustrating the peculiar manner in which these novel mills were fitted up. On the conclusion of the war one of the mills, purchased by a firm of French millers, was worked at Constantinople for some years.

CHAPTER XI.

THE TIDE MILL.

XI. TIDE MILL.

1. Medieval.

1. THE historian D'Aussy observes that it was in the eighteenth century that discovery was made of the method of employing the ebb and flow of the sea for mill driving, the invention being due to a carpenter of Dunkirk named Perse. Tidal mills, however, were known in England long before that period, not to mention the mill at Dover harbour at the time of Domesday which is presumed to have been a tide mill. In Devonshire, in 1526, Sir Peter Edgecumbe, lord of the manor of East Stonehouse, acting with the co-operation of the lord of a neighbouring manor, constructed a causeway across the upper part of Stonehouse Pool or Lake, impounding the waters behind and releasing them through three arches in the causeway to work cornmills; the water being impounded at high tide and the mills worked on the ebb. They are shown in the old map of Plymouth Haven drawn in the reign of Henry VIII., and engraved in Lyson's *Devon*. In Hampshire water-power was frequently derived from the tides, and examples of local tidal mills still remain at Eling, near the head of Southampton Water, at Fawley, and elsewhere. The arrangement was such as to allow the tidal water to flow at the flood into a reservoir, and to utilise it subsequently on the ebb. Several such mills were in operation in the Middle Ages on the Itchin, in the eastern suburb of Southampton. One of the most interesting was situated close to the east wall of

La Vie Pr. Fr.: 1815 ed., I. 57.

Western Antiqy., 1886, 145.

XI. TIDE MILL.

Southampton, the town moat forming the reservoir and the race being under the fortifications; the mill being described in the records of the town as *communis molendini aquatici subtus Altam Crucem extra portam Domus Dei*—the common watermill under the High Cross outside the gate of God's Hospital. In 7 Henry VI. (1429), this mill was farmed by the borough at an annual rent of 20s.

1. Medieval.

2. Modern.

2. In 1729 a private Act of Parliament authorised John Woods, William Woods, and John Challen, merchants, to erect one or more tide mills for grinding corn and grain upon a creek in the manor and parish of Bishopston, Sussex; and shortly after that date various attempts were made to establish satisfactory mills of this character. In 1760, the Society of Arts offering a premium for tide mills, seven designs were submitted; "that of J. Nichols, of Lambeth, was preferred, but as the model of R. Lewis appeared to have some merit, Nichols was desired to give to Lewis £20 out of the premium of £50, which he did." The report contains no specification of these mills. In 1761 the Rev. H. Gainsborough, of Henley, was awarded the full premium for a tide mill. "This mill is constructed upon the following principles:—(1) There are a water-wheel two feet in diameter, including floats, ten in number; and a crown-wheel, one foot in diameter, with eighty cogs. These wheels are raised or lowered in the water as the tide flows and ebbs, with a double lever, arched at each end; its fulcrum or pivot being two-thirds of the moving power; at the extremity of which a stronger iron chain is fastened for raising and lowering the water-wheel. (2) There are float-guides which regulate at any degree from high to low water the aperture or issue of the water; being proportionate to the floats and the force of the water required. (3) There is a contrivance at the head and tail of the mill which occa-

2 Geo. II., c. 12.

Socty. for Enc. of Arts: Report 1772, 302 passim.

XI. TIDE MILL.
2. Modern.

sionally makes a fall of water to each. (4) A sliding lantern pinion, with eight trundles on a perpendicular shaft, is provided; on the top of the shaft being a spur-wheel intended to turn two pair of stones. This lantern wheel is made to slide as required from the upper to the under side of the crown-wheel, by which means the stones are at all times turned the same way, though the water-wheel turns backwards and forwards with the flux and reflux of the tide. (5) This mill has a false bottom or fence-board, which is raised or lowered with the water-wheel, by which the dead water under the float-wheel is conveyed off by a sort of whirlpool." In 1764 Robert Lord was awarded a premium of ten guineas for a tide mill constructed upon two caissons, the water-wheel working both with the flux and reflux of the tide, and the whole mill rising and falling therewith: "by means of two face wheels fronting each other, the mill shifts on its axis so as to work the crown-wheel alternately and turn the stones constantly the same way, though the water-wheel changes its motion with the tide." These mills appear to be of the same nature, so far as the alternate motion of the water-wheel is concerned, with the medieval floating-mills of Venice. A somewhat similar mill, by W. Coulthard, in 1762, containing "many ingenious and useful contrivances," was awarded a premium of £20.

At Liverpool a corn mill erected upon the shore, and provided with a tidal reservoir for driving the wheel at all states of the tide, was opened with great *éclat*:—"We have the pleasure to inform the public that on Wednesday last the tide mill erected in the Earl of Sefton's improving and commodious town of Harrington, adjoining Liverpool, by the engineer Mr. Jackson (and for which he has received His Majesty's Royal Patent) was set to work: when it answered the most sanguine expectations of the spectators, and

Billinge's Advertiser, Oct. 25, 1796.

gave pleasure to a number of ingenious friends: fully convincing every unprejudiced person of its future utility to the public. We consider this invention is the effect of a genius surprising, as well as patriotic, liberal, and extensive.

> "May genius still to Harrington add grace
> As still her numerous works and wealth increase:
> Beneath the generous Sefton, just and wise,
> May his new town a second Carthage rise."

Mr. Jackson, "the engineer," is described in his specification of the invention as a pawnbroker. Reference to his patent affords a fair idea of the invention, but the specification is somewhat meagre and without drawings. The invention comprises "the working of a watermill by the force of water, from any river in which the tide ebbs and flows, at all times, whether at high or low water, and whether while the tide ebbs or flows. This is achieved by a particular contrivance for conveying the water to and from the wheel: by which means the latter is in constant motion, and never stops but at the manager's pleasure." . . . "To convey the water to or from the wheel is to have two revisers [reservoirs] both of equal size; the one to receive the water at high tide by a sluice or slide; the other to receive the water from the wheel, and to discharge it at low water by a sluice:—to divide the falling and ebbing of the tide into three parts; that is to say, where the tide falls fifteen feet, five feet for the upper reviser, five feet for the fall in the wheel, and five feet for the lower reviser. So by taking in a proper quantity of high water to carry the wheel, and by discharging it at low water from the lodge below the wheel the latter is in constant motion, and never stands but at the manager's pleasure. There are two ways of placing the revisers; either to have them right over one another, or to place them side by side. But the first way is most complete." We believe that eventually the high water reservoir comprised about eight

XI. TIDE MILL.

2. Modern.

and a half acres water space, and the smaller, into which the stream ran from the wheel, about one and a half acres. The concern established on this basis evidently throve for a time, and the proprietors manifested as great enterprise in conducting the business as had their engineer and manager in inaugurating it. The mill continued in operation till 1827, when the site was required for dock extensions. The proprietors, failing to come to terms with the authorities, entered a claim for compensation at the assizes, retaining the future Lord Brougham as their counsel, and securing an award of £49,400 for their property, which shortly afterwards was swept away. The site, which is shown on "a plan of the town of Harrington" (Binn's Collection of Drawings; Public Library, Liverpool, vol. ix. f. 36), appears to have been upon the river shore at the bottom of Sefton Street, now covered by the quay and railway station at the Brunswick Dock.

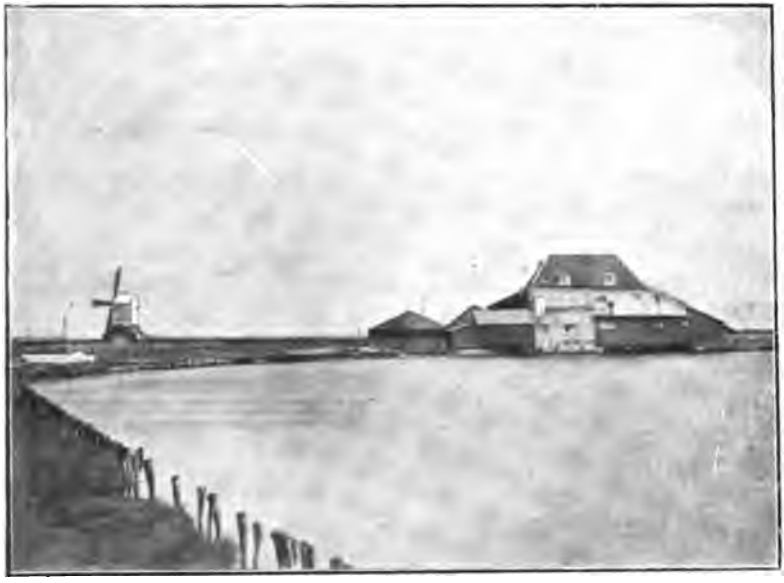
In 1817 most of the grain for the Naval Victualling Office at Portsmouth was ground at a tide mill erected there by Government at a cost of £6000; the structure standing on piles on the shore, and the wheel being worked by a stream drawn at high tide from the harbour into a reservoir.

At Walton-on-Naze, Essex (commonly known by its curious ancient designation "Walton-le-Soken"), a tide mill of extensive proportions exists, though not at present worked. It is situated near an old post windmill, both structures appearing in the annexed view. The watermill is driven from a reservoir retained by a dam on the tidal river Hanford, from which it is allowed in the usual manner to flow on the ebb.

A tidal mill in the Orkneys is stated to be still at work. "The harbour of Kirkwall is separated by a long narrow neck of land or natural causeway, along which runs the new Stromness Road, from a tidal

Antiqs. of Orkney: Turray, 18.

lake designated the Piri Sea—*Piri* in the Orcadian meaning 'little.' This is connected with the harbour by a passage through which at all times the ebb or



Walton-on-Naze.—*Photo. by P. H. Gault, Kew.*

flow causes a current of great rapidity to run, and an ingenious Orcadian has taken advantage of this to use it as the motive power of a great mill, which he has planted on the causeway. This seems to be looked upon as one of the wonders of the place, as we had our attention called to it as the only tidal mill known. It scarcely, however, comes up to the ingenuity of one which, if we believe the guide books, exists in the island of Sivona. On all the islands a stormy west wind lashes the ocean spray over the surface, but on Sivona it is in such quantities as to have rendered it advantageous to form a pond for its collection, whence it is afterwards drawn off to move a thrashing mill. It is certainly reducing theory to practice to employ the Atlantic as the direct feeder for a mill pond."

SECTION II.—WINDMILLS.

CHAPTER XII.

MYTHS OF ORIGIN.

XII. MYTHS OF ORIGIN.

1. No Ancient Evidence.

1. OVER a thousand years elapsed after the introduction of watermills before any authentic evidence occurs of the existence of a windmill. Some speculation and much inaccuracy have been indulged in, in the attempt to demonstrate the existence of windmills in classic Greece, early Gaul, and Saxon England: but among the whole of the reliable records of ancient and early medieval times, there seems to be no single reference to the windmill; no suggestion that the power of the wind was then ever used for corn grinding; no law nor charter mentioning a windmill; no occurrence in history connected with it. The somewhat ambiguous suggestion of Sabinus (*c.* 1480) apparently attributing the invention of wind and other mills to Cappadocia, has already been incidentally quoted. It remains to note that had the windmill been known, not in early Grecian times even, but at the later epoch when Vitruvius described the mechanical and engineering resources of Rome, *c.* 20 B.C., he would certainly not have overlooked it. He describes all the known motor forces of nature, furnishes exact specifications of water-wheels and one water cornmill: and refers to machines driven by the wind under the term "spiritalia," by which, he says, "motions and organ sounds are produced," but makes no mention of a windmill. Nor is the windmill mentioned by the

XII. MYTHS OF ORIGIN.

philosophical and travelled Seneca in his "Natural Questions" (v. 18), written in the Christian era; nor yet by Chrysostom the Patriarch, who, in the fourth century, definitely refers to the forces of the wind.

1. No Ancient Evidence.

Except for certain scattered random statements and untenable suggestions shortly to be quoted, history seems to be utterly silent as to this mill till the closing years of the twelfth century, when the first authorita-

Egerton MSS. 1070: 29b.

Fifteenth Century Miniature *Horæ B. Mariæ Virginis.*

XII. MYTHS OF ORIGIN.

1. No Ancient Evidence.

tive record refers to one erected in England. Records of the twelfth century are replete with evidences of the then novel contrivance being generally adopted throughout Europe; and within a couple of centuries later so ordinary were they that numerous miniatures in illuminated MSS. of the Bible are found to depict windmills in early Hebrew landscapes (as, for example, in a drawing representing the finding of Moses); or in paintings pourtraying passages in later history, as, for example, a scene in the life of the Virgin Mary in *Horæ B. Mariæ Virginis* of about the year 1450 in the British Museum.

Text: p. 254.

Passing over these not unusual anachronisms of the medieval artist, we may briefly cite some of the more prominent errors into which various writers have fallen in attributing too early an origin to windmilling.

2. Of Fourth Century.

2. On the authority of the Welsh chronicler Iolo Morganwg, the Rev. J. Jones, of Llanymonddwg, the writer of "Britain under the Druids" elsewhere referred to, has stated that windmills and watermills were adopted in Wales in the year 340 A.D., an assertion which, as regards windmills, lacks probability.

Text: II. 81.

3. Of Seventh Century.

3. A Saxon windmill of 669 seems to be suggested in the history of St. Augustine's, Canterbury, written about the year 1414 by Thomas of Elmham, formerly a monk and treasurer of that foundation. Describing the allotment of a portion of Thanet to Domeva by Egbert in the year 669, in atonement for the murder of her brothers, Thomas illustrates the partition of the island by a map, upon which is depicted on the slope of the beacon hill at Birchington a windmill. Still there can be no doubt that the mill which stood there when the map was drawn in 1414 did not exist in the time of Saxon Egbert. A portion of the map showing the mill is reproduced on a later page.

Hist. Mon. St. Aug. Cant.: viii. (5).

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4. Before the year 718, says a German chronicler of the seventeenth century, windmills were used in Bohemia: "At the same period (718) one named Halek, the son of Uladi the Weak, built close to the city an ingenious mill driven by water. . . . Before that time all the Bohemian mills were windmills erected on mountains." The statement, which appears absurd, is well annotated by Beckman, who curtly observes, "I shall consider it false."

4. Of Eighth Century.

Chron. Bohem.: Hagec.: J. Sandel: 1697, 23.

Hist. Inv., 1797, I. 248.

5. Ingulphus, the alleged historian of Croyland, quotes the false charter of Witlaf, king of Mercia, dated 833, in which a windmill is mentioned. In this charter, which is elsewhere quoted, the clause referring to the mill states that Witlaf confirmed to Croyland Abbey a gift previously made by Normanus of two caracutes of land, and one windmill in Sutton, near Bosworth:—

5. Of Ninth Century.

Rerum Anglicarum Scriptores: Saville: 1596.

Text: p. 98.

Item donum Normanni quondam vicecomitis in Sutton juxta Bosworthe duas caracutas terræ et unum molendinum ventricium.

Codex Dipl. Ævi. Sax.: Kemble: I. 301.

This charter has been accepted in good faith by the modern writer Frost, town-clerk and topographer of Hull, who observes:—"It has been a generally received opinion that windmills were not known in England before the Conquest. We have, however, in the course of our inquiry on this subject met with a much earlier notice of a windmill in the charter granted by Witlaf, king of Mercia, to the Abbey of Croyland, Lincolnshire, in the year 833, which confirmed to the abbey a gift by Normanus of certain land, and one windmill molendinum ventricium in Sutton. *Ingulphi Historia*, fol. 488." Frost was evidently unaware of the frailty of the alleged history of Ingulphus and the charter in question. Ingulphus, Abbot of Croyland, died in 1091, and windmills even then appear to have been unknown. The history attributed to him is on many grounds considered to have been written nearly a century after his death by some writer unknown;

Hist. Hull: 1827, c. V.

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5. Of Ninth Century.

at a period when windmills were coming into vogue. To use the words of Sir Francis Palgrave, the many anachronisms in the history "place the work of Ingulphus amongst the apocrypha of English history." A critical dissertation by the eminent authority named upon the authenticity of the monograph of "the pseudo Ingulphus—for we can no longer give any other name to the writer," concludes with the opinion —"Do we then *bonâ fide* consider the history of Ingulphus as being little better than a historical novel? We must decidedly give an affirmative answer to the question. We believe it to be a mere monkish invention. . . . The Croyland charter in Saxon characters in the possession of Robert Hunter, Esq., lord of that place, was shown to the Society of Antiquaries, as appears by their Minutes by Mr. Lenthellier in 1734 (Gough's 'Croyland': Pref. viii.). In the opinion of Humphrey Wanley, 'it was not much older, if anything at all, than the time of Henry II.,' and the facsimile given by Hickes (Dissertatio Epistolaris, tab. D.), does not leave the slightest doubt of the imposture." After this we need not hesitate to reject the evidence of "the pseudo Ingulphus" as to the alleged Saxon windmill of the year 833.

Quarterly Review: 1826: 262–292.

6. Of Tenth Century.

6. The estimable Strutt unfortunately adds his contribution to the mystification by speaking of Saxon windmills, but quoting no proofs of their existence. "The low situations on rivers [where watermills were built] would have been very inconvenient for windmills; they, however, seem also to have been known to the Anglo-Saxons, and sometimes are mentioned in the charters, but not so frequently as watermills: which is a good argument they were not so common." Still he quotes no such charters, and among those collated since Strutt's day no reliable allusion to a windmill has yet been discovered. In another work Strutt furnishes a more correct appreciation of the

Chron. Eng. 1778: II. 219.

Hord. Ang., 1775: II. 13.

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probabilities of the case:—"The date of the windmill is uncertain, and whether some of those mills mentioned in ancient charters were windmills is very doubtful."

7. Of Eleventh Century.

7. Shakespeare has been unjustly burthened with the anachronism of recording the existence of a windmill in the time of the Conqueror. To the immortal bard has by some been attributed the authorship of a trivial play, *Fair Em*,* in which Goddard, a Saxon Knight in reduced circumstances, shortly after the Conquest, becomes the working owner of a windmill:—

> "Sir Thomas Goddard, now 'Old Goddard,' is
> Goddard the Miller of Fair Manchester . . .
> Come, daughter, we must learn to shake off pomp
> To leave the state that erst beseemed a knight
> To undertake this homely miller's trade."

Dict. Antiq., 1825: I. 425.

The Gloucester antiquary Fosbroke also states "the encyclopedists assert windmills were introduced into France and England about 1040:" but either he or his authorities are in error. The valuable Survey of mills included in Domesday affords presumptive evidence that windmills, the name of which does not once occur in the record, were unknown in England even in 1086.

8. Of Early Twelfth Century.

8. Mabillon, historian of the Order of St. Benedict, quotes a charter of 1105, by which the Abbot of Savigny is granted leave to erect either watermills or windmills, molendina ad aquam et ventum, for the abbey of Holy Trinity at Newburgh, which he was then building; and Carpentier quotes the same charter as an early evidence of a windmill: but the document is admittedly a monkish forgery, perpetrated certainly a century after the date it bears. Other French writers have adopted Mabillon's evidence:—"Lebeuf (*Sciences depuis Robert jusqu'à Philippe*,

Annales Ordinis, St. Benedict, 1713, v. 474.

Gloss. Nov. 1766: Mol. ad vent.

Doc. Inedit. Fr. xxxvi. Prolo. 212.

* *Fair Em, the Miller's daughter of Manchester; a pleasant comedy; As it was sundry times acted in the Honourable City of London by the Right Hon. the Lord Strange's servants*, 1631. The first edition of this play is undated; the second was issued in 1619, and another at Dublin in 1750. It was considered to have been written by Shakespeare, and was translated into German by Tieck; while a copy in the British Museum has been lettered by some former possessor with Shakespeare's name.

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8. Of Early Twelfth Century.

1740) and Le Grand d'Aussy (*Vie Privée des Français*, 1752) carry back the use of windmills as far as the opening years of the twelfth century; but the falsity of the Neubourg charter [above mentioned] upon which they rely, is proved."

Hist. Inv. 1797, I. 250.

Beckman states that, in 1143, there was in Northamptonshire an abbey which, in the course of 180 years, lost its entire plantations, owing to the timber being indiscriminately cut down for the building of houses, windmills, &c. Reference to Dugdale shows this abbey to have been that of Pipewell, and the loss of the timber to have occurred during the 180 years after—not before—1143. It was in the year 1323 that the abbey was abandoned by the monks, and a statement drawn up of the causes which had led to the poverty and ruin of their house:—

Mon. Ang. 1682, I. 816.

Præterea non fuit in patria aula camera orreum molendinum ventricium sive aquaticum alicujus valoris plantata sine adminiculo aliquo boscorum Sanctæ Mariæ de Pipewalla; et quot vergæ molendinorum venticiorum dabantur in temporibus diversorum abbatum nemo novit nisi Deus.

There was not erected in the whole neighbourhood hall, house, granary, windmill, nor watermill, but what was built at the expense of the woods of St. Mary of Pipewall; nay, during the time of several abbots, for even renewing the sailyards of the windmills, people trusted to the house of God.

There is no evidence that this statement, written in 1323, had any reference but to windmills built long after 1143.

9. Of Crusaders.

9. The whole of the foregoing fallacious theories and suggestions considerably antedate the advent of the mill; but there are others which range much more closely to the actual date. Popular opinion has decreed that the Saracens invented the mill; and though it is not indeed improbable that the waterless regions of Persia or Arabia may have witnessed the first attempt to compensate the absence of water by utilising the wind, yet there is no evidence that the Saracens ever saw such a mill, or that the Crusaders

derived a knowledge of the contrivance from that part of the world.

9. Of Crusaders.

As a matter of curiosity, it may be noted that a windmill tower of the Crusaders' period still exists in Syria, but nothing is known of the precise date of its erection. It stands on the outer wall of a Templar fortress, situated a little to the south of Antioch, which was abandoned in 1271. On the summit of the outer wall are the foundation and lower storey of the tower of the mill, the upper portion of the structure having been of timber, as shown in the restored design of the mill by the French architect, Viollet le Duc.

Templar Mill near Antioch.

In 1271, when this fortress was abandoned, windmills were of common occurrence throughout Europe, Monuments des Croises, 1871, 39–43.

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and the instance in no way establishes a connection between their origin and the Crusades.*

9. Of Crusaders.

Vie Priv. Fr., 1752, I. 62.

D'Aussy, referring to the tradition of the Crusaders having introduced the mill, remarks: "This is the reason why we so frequently find the different parts of these mills in ancient heraldry." In suggesting that heraldry supports the Crusade connection with windmilling, D'Aussy is altogether in error, for among the various well-known heraldic devices relating to cornmills there does not appear to be a single one relating specially to windmills. De Roquefort, a later editor of D'Aussy's work (1815), says he has found it impossible to find any heraldic charges representing the parts of a mill, and not only fails, therefore, to discover the milling coats of arms of some of the most distinguished of ancient families, but, further, commits the error of stating that "the choice of these milling devices little agreed with the spirit of the times." Non-industrial as were the nobles of ancient feudal periods, some of the most magnificent of them carried on pennant and surcoat emblazons which originated solely in the cornmill; as, for example, the rynd or cross moline of the Molyneux family, the fusil or mill-pick of Percy Hotspur, the three mill-stones of the Millingtons, &c.† None of these, however, relate

* The custom of erecting windmills on the fortified walls of cities prevailed very generally till comparatively modern times. At Carcassone, in Aude, France, in 1467, the mills were so placed. On the walls of Paris, as shown on the map of Matt. Melian, *c.* 1630, there were many mills. At Ghent, in 1708, a great number of mills stood on the city walls (Tindal's "Rapin," bk. xxvi.), and Leyden, at the same period, exhibited a similar scene (Hallam's "Hist. Lit., sec. iv."). The walls of Copenhagen, again, were surmounted by many windmills.

† The fusil or pick of the miller has for ages held an honourable and distinguished place in heraldry, of which the picks emblazoned on the ancient shield of the house of Percy afford a conspicuous instance. The blazon of "fyve mill pykes" was borne by William, Lord Percy, who died in the Crusades. His sole heir, his daughter Agnes, marrying Josceline de Louvaine, the latter adopted the mill pick as his coat-of-arms, from whom they are derived by the Dukes of Northumberland. Various other families bear the fusils, some with the addition of handles, as those of the Moseley family ("Gloss. Her." 223).

Archeo. Æliana: 1860.

A singular instance is recorded of the adoption of the fusil with the addition of the rynd—the whole purely as distinctive of the craft of the miller, and not

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specially to the windmill; and, as already said, no connection between windmills and Crusaders is to be established by recourse to heraldry. With one other reference this portion of our subject may be dismissed.

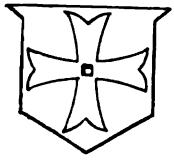
A curious allusion to windmills erected on board ship in the Crusades by Richard I., occurs in Langtoff's *Chronicle*, written towards the close of the thirteenth century, but supposed to refer to an event dating between 1189 and 1193:—

"In bargeis and galleis
He set mylnes to go,
The sailes as men sais
Som were black and blo:
Some were rede and grene
The wynde about them blewe,
A selly sight to sene
Fire the sailes threwe.
The stones were of Rynes:
The noise dred fulle and grete.
It affraid the Sarazins
As leven the fire out sight."

Strutt observes, "This imports that in his barges he had mills which were turned by wind, and by force of the sails threw fire, and stones which were got from the Rhine." These constructions, therefore, are not to be accounted in any sense corn mills, and their

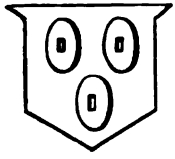
Hord. Ang. II. 31.

as a charge in heraldry—in Ryton churchyard, on a gravestone, which beneath the shield bears the inscription—"Heare lyeth the bodye of Jane Smith, wife was to William Smith, miller. She departed to the mercye of God the 29 of December 1621."



The cross-moline or mill-rind of the Molyneux shield, as borne by the ancestors of the Earl of Sefton, contains the central lozenge or piercing as in the true rynd.

Gregson's Portfolio, 141.



The ancient family of Millington, of Millington, Cheshire, bore quarterly, three millstones.

Omerod's Cheshire, I. 448.

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alleged use does not bring us any nearer to the discovery of the date of the latter; besides, the verses were written about two centuries after the Crusade, and may have been, as indeed they seem to be, a pure fiction of the rhymester.

So far as these various fragmentary traditions and evidences go, therefore, they fail to attribute to either the Saracens or the Crusaders the introduction of the mill. Though even yet nothing definite is ascertainable as to the precise place or time of its origin, still one indisputable fact is, that it first appears on the records as in use at the close of the twelfth century; and very probably it had followed in the wake of the wave of progress, religious, military, and industrial, which pervaded Western Europe after the first two Crusades. If the mill existed in Germany or the East at that time, the Crusaders may be reasonably considered to have seen it and brought the idea westward.

CHAPTER XIII.

THE EARLIEST RECORD.

XIII. EARLIEST RECORD.

1. THE actual date of the first undisputed windmill has variously been given.

1. Various Conjectures.

Strutt cites as "the first account I have met with where a windmill is particularly described," the grant of one to a nunnery at Ridingate, Canterbury, "about the reign of King John (1199–1216)." Bray, editor of a history of Surrey, carries the date to a slightly earlier period; stating that the first mention of a windmill of which he is aware occurs in a grant by Odo de Dammertun to the priory of Tanrigge, "supposed to be about the time of Richard I. (1189–1199)." Du Cange, and other authorities, quote as the earliest the windmill mentioned in a decree of Pope Celestine III. (1191–1198), and believed by Du Cange to be of date 1195; when a question having arisen as to whether a windmill was liable to payment of tithe the Pope decided in favour of the Church—de redibus molendini ad ventum solvendæ sunt decimæ. Evidently at this early date the windmill was a novelty.

Hord. Ang., II. 13.

Manning's Survey, II. 581

Decretal Greg. III. 30.

2. Dean Herbert's Mill.

2. The whole of these instances may be preceded by the occurrence of a windmill in England in 1191, the earliest authoritative instance at present extant. This was the illegal mill built by Dean Herbert in his glebe lands at Bury St. Edmunds, and by order of Abbot Samson pulled down. The Chronicle of the abbey, in which the affair is fully reported, is one of the most indisputably genuine of the early monkish records, and its evidence of the windmill is therefore

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perfectly reliable. The incident is related by Jocelyn, almoner and cancellarius, with considerable vivacity, and some humour:—

Chronicon: Joceylin de Brakelond, 43.

Herbertus decanus levavit molendinum ad ventum super Hanberdun, quod cum audisset abbas tanta ira excauduit quod vix voluet comedere vel aliquod verbum proferre. In crastino, post missam auditam, præcepit sacristæ ut sine dilatione faceret carpentarios suos illuc ire et omnia subvertere et materiam lignorum in salvam custodiam reponere. Audiens hoc decanus, venit dicens se hoc de jure posse facere super liberum feudum suum nec beneficium venti alicui homini debere denegari, et dixit se velle suum proprium bladum ibi molere non alienum ne forte putaretur hoc facere in vicinorum molendinorum detrimentum.

Et respondit abbas adhuc irratus:—"Gratias tibi reddo ac si ambos pedes meos amputasses: per os Dei numquam panem man ducabo donec fabrica illa subvertatur. Senex es, et scire debuisti quod nec regi nec justiciario licet aliquid immutare vel constituere infra bannamlencam sine abbate et conventu: et tu tale quid præsumsisti? Nec hoc sine detrimento meorum molendinorum est, sicut asseris quia ad tuum molendinum burgenses concurrent et bladum suum molerent pro beneplacito suo, nec in eos possem de jure advertere, quia liberi homines sunt. Nec etiam molendinam ęelerarii noviter levatum stare sustinerem, nisi quia levatum fuit antequam fui abbas. Recede," inquit, "Recede: antequam domum tuam veneris audies quid fiet de molendino tuo."

Decanus autem timeus a facie abbatis, consilio filii sui magistri Stephani famulus sacristæ præveniens, molendinum illud elevatum a propriis famulis suis, sine omni mora, detrui fecit: ila quod venientibus servientibus sacristæ nichil subvertendum invenerunt.

Carlyle's vigorous rendering of the foregoing (with the necessary insertion of one or two omissions) may aptly take the place of a mere literal translation:—

Past and Present: Bk. II. ch. xv.

We said withal there was a terrible flash of anger in Samson: witness his address to old Herbert the Dean, who in a too thrifty manner has erected a windmill for himself on his glebe lands at Haberdon. [So overpowering was the ire of Samson when he heard of it that he could neither eat nor speak.] On the morrow, after Mass, our lord abbot orders the sacristan to send off his carpenters to demolish the said structure without delay, and lay up the wood in safe keeping. Old Dean Herbert, hearing what was toward, comes tottering along hither to plead humbly for himself and his mill [urging that surely on his own holding, where no man could deny him the benefit of the wind, he had a right to build the mill, which, moreover, he intended merely for grinding his own corn, and which could not, therefore, be imputed to injure the custom of the abbey mill]. The irate Abbot answers: "I am as obliged to thee as if thou hadst cut off both my feet! By God's face I will not eat bread till that fabric be torn in pieces. Thou art an old man and

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2. Dean Herbert's Mill.

shouldst have known that neither the king nor his justiciary dare change aught within the liberties without consent of abbot and convent; and thou hast presumed on such a thing! I tell thee it will *not* be without damage to my mills; for the townsfolk will go to thy mill and grind their corn at their own good pleasure; nor can I hinder them since they are free men. I will allow no new mills on such principle [and unless they were built before I became abbot they shall not remain]. Away, away! Before thou gettest home again thou shalt hear what has become of thy mill." The very reverend old dean totters home again in all haste; tears the mill to pieces by his own carpenters [and when the servants of the sacristan arrive nothing to pull down do they find].*

"Easy to bully-down poor old rural deans and blow their windmills away," moralises Carlyle; but the dean was not unjustly bullied-down after all. As will be clearly seen later, he had no right to use the wind to the detriment of Abbot Samson or any other millowner; his mill was, therefore, illegal, and it was in accordance with the law that it was "blown away" by his injured monastic lord. The record of this windmill of 1191, as already stated, is the earliest now known. The circumstances attending its erection are precisely such as might be expected to accompany the establishment of a practical novelty. Dean Herbert, though an old and no doubt a wise man, apparently knew nothing of the legal responsibility he incurred in erecting it; though a few years later such knowledge was common to every rustic on the country side.

The designation applied by Jocelyn to the mill is molendinum ad ventum. Its later ordinary designation was m. ventriticum, though several variations of the term occur; *e.g.* molendinum ventosum (1350), m. aurerium (1377), m. ventile (1490).

* "The story of Samson's life furnished Carlyle with material for a series of graphic chapters in his *Past and Present*, under the title 'The Ancient Monk'; and the masterly picture there drawn will ever remain a standing ornament to our literature. Writing under a sense of the hopelessness of democracy, and believing that the heroic ruler, gifted with the necessary courage and insight, was the sole hope whether of a misguided nation or a struggling institution, Carlyle, who had read the *Chronicle* of Jocelyn, conceived that Abbot Samson was a living example of the truth and value of his principle. So might Englishmen, he argued, set the heroic element in command and precedence whenever wise organisation is required."

Memorials. St. Edmund's Abbey: xlvii.

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2. Dean Herbert's Mill.

Confirmatory of the general result of our researches as to the origin of windmilling is the statement of the modern editor of a French monastic chartulary:—"The mills mentioned in this chartulary all occur in documents of date previous to the second half of the twelfth century; they will be well understood, therefore, to be entirely watermills, since at the period in question none others were known in Europe:" Ils étaient, bien entendu, des moulins à l'eau puisqu' on n'en connaissait pas d'autres en Europe à l'époque qui nous occupe.

Cart. L'Abbaye de Rendon Bretgne: Prolo. 212.

3. Rapid Adoption.

3. In the thirteenth century, windmills prevailed extensively throughout Europe. The Taxation Rolls of Nicholas III. in 1291 abound with records of their possession by most, if not all, the great monastic houses. Still it is evident that in some places they were regarded as novelties in even the fourteenth century. In 1332 Bartolomeo Verde applying to the Venetian authorities for permission to erect a windmill, consent was given after due examination of his plans to his retaining the site for a specified period should the project prove successful. And in 1393 the authorities of Spires, on desiring to erect a windmill, sent to the Netherlands for a practical man acquainted with the method of building and working it. At this time, however, in Britain and Western Europe generally, windmills were in very extensive use. So familiar indeed were they, that, as already said, in fourteenth century MSS. imaginary windmills were frequently depicted in miniatures representing scenes in Biblical history: the medieval artists including them as ordinary adjuncts of landscapes in the Holy Land, but sketching them as seen by themselves in England or France. Some examples of these Biblical curiosities we reproduce later. In the same way the miniatures in many early secular histories written at the same period liberally represent windmills in ancient

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landscapes; as in John Lydgate's "History of Troy," (f. 7) an illuminated MS. included in the collection of Earl Crawford and Balcarres at Haigh Hall, Lancashire: and the "Chronicle of St. Alban's" (ff. 33, 93, 125) preserved in the library of Lambeth Palace: both productions being of the fifteenth century.

Text: p. 255.

The myths and fallacies which have crowded round the earliest windmill may, in conclusion, be illustrated by one or two errors as extraordinary as any of ancient times. An antiquary of the early part of the present century postpones the introduction of windmills into England till even after the reign of Henry VIII.:— "no mention is made of windmills in Italy till the fourteenth century; and that they were not known in England in the reign of Henry VIII. appears from a household book of the Earl of Northumberland, stating an allowance (payment) for three mill horses, 'two to draw in the mill, and one to carry to and fro.'" But what relation this entry respecting a horse mill can be imagined to have with regard to windmills is not clear; and in the time of Henry VIII. the latter had been in common use for over three centuries. Probably some misprint is accountable for the curious statements made at the Annual Convention of Winter Wheel Millers' League, U.S.A., at St. Louis, in May 1897, by a member who delivered an address on "French Milling Industry"—"the next stage in the development of milling was the pounding of grain in mortars; and then came the flat French buhrs. At this same period windmills were introduced from the Orient, and were popular *till the eleventh century, when they were supplanted by the watermill*"—as strange a perversion and reversal of fact as could well be conceived.

Antiq. and Hist. Notes: Jennoway, 1827, 348.

The Miller: July 5, 1897.

CHAPTER XIV.

SOKE OF WINDMILLS.

XIV. SOKE OF WINDMILLS.

1. An Erroneous View.

1. It is evident that a windmill illegally erected could invade the rights of others, precisely as could a watermill. It remains to show that a windmill again, like a watermill, could possess exclusive rights to milling all the grain for its immediate neighbourhood, *i.e.*, for the manor in which it was situated. So eminent a modern writer as Thorold Rogers has expressed some doubt on the point:—"the right of having a watermill was a franchise, and could not be invaded without liability; but it is not so clear whether a similar limitation applied to windmills;" the period referred to being the fourteenth century. The limitation certainly did so apply, and windmills possessing soke grinding rights over manors were common throughout the country for centuries. Various instances of the fact may readily be discovered in this record: but one or two not elsewhere noted may be cited here. At Augres, Jersey (where of course feudal laws prevailed), in the year 1300, the owner of the manorial watermill abolished it, and erected a windmill; and in an action brought to substantiate the rights of the latter, it was decided in the Courts that the watermill being by reason of an increase of population become incapable of meeting the demand, the windmill took its place and embodied all its old rights.

Hist. Agr. and Prices, I. 33.

Domesday Book of Jersey: Soc. Jersiaise.

2. Ince Soke Deeds.

2. A more direct case is found in the grant of a windmill with soke of the town of Ince, Lancashire,

about 1230, to Stanlawe Abbey, Cheshire: further evidence on the point appearing in a judicial record of 1283, in which the tenants of Ince, pleading guilty to having refused their custom to the mill, promise to yield it in future.

XIV. SOKE OF WINDMILLS.

2. Ince Soke Deeds.

Hec est conuentio facta inter abbatem et conuentum loci Benedicti de Stanlawe ex una parte et Willmum filium Johannis Blundel de Ynes ex altera. Ita videlicet quod predictus Willmus dedet concessit et hoc presenti scripto confirmauit dicti abbati et conuenti totum molendinum suum ventricium in territorio de Ynes cum secta omnium hominum in dicta villa de Ynes manentium, nichil sibi vel heredeb3 suis in dicto molendino retinendo nisi tummodo libertatem molendini omnimodum bladum et brasium domus sue proprie sine multura, et hoc post illud bladum quod super molendinum invenerit et hoc sine fraude utriusque partis. Eandem et libertatem predicti abbas et conuentus dicto Willmo et heredib3 suis in molendino suo aquatico quod situm est super ripam de Alte in omnib3 et p omnia p se et successorib3 dederunt et concesserunt. Habendum et tenendum dictis abbati et conuentui et successorib3 suis imppetuum de dicto Willmo et heredi3 suis totam molendinum ventricium cum prefata secta et illam plateam terre super quam dictum molendinum ventricium situm est, et etiam cum libertate fodiendi et capiendi terram circumquaque ad situm dicti molendini elevandum et exaltandum, quotiescunque necesse fuerit ubi dictus Willmus capere solebat, et etiam unam plateam terre extra dictum situm ad triticum purgandum in vento, ubi dictus Willmus et eius homines purgare solebat, et etiam cum libero introitu et exitu situm ad dictum molendinum cum bobus et equis ad molas et meremium cariand, et alia cariagia facienda p vias et semitas quib3 dictus Willmus et homines sui ad dictum molendinum accedere et uti solebant; cum omnib3 libertatib3 ptenentijs et commodis dicto molendino ventritico ptinentib3. Nichil inde dicto Willmo et heredeb3 suis p annum reddendo nisi preces et orationes. Salvis tamen omnib3 liberatib3 sibi et heredib3 suis in dictes molendinis in omnibu3 et p omnia ut prenotatem est. Pro hac autem concessione dicti molendini cum omnib3 ptinentijs suis supradictis veri religiosi supradicti dicto Willmo decem marcas argenti p manib3 dederunt. In cuius rei, &c.

Coucher Book Whalley Abbey, II. 509.

This is the agreement made between the abbot and convent of Benedictum Locum [the "Blessed Place" *] of Stanlawe on the one part, and William, the son of John Blundell of Ince, on the other: to wit:—The said William has given, conceded, and by this present writing, confirmed to the said abbot and convent all his windmill in the territory of Ince, with the soke custom of all the men living in the said town of Ince: no right in the said mill being reserved to him or his heirs except that of grinding all corn and malt for the proper use of their manor house without payment of toll, such corn and malt

* Locus or place was the ordinary monastic term at this period for an abbey.

XIV. SOKE OF WINDMILLS.

2. Ince Soke Deeds.

to be ground next after that which happens to be actually grinding in the mill when it arrives; and this without fraud on either part. And the same liberty, fully and completely, the said abbot and convent, for themselves and their successors, have given and conceded to the said William and his heirs in his watermill which is situated on the bank of the Alt [this neighbouring mill having evidently also been granted to the monks]. To have and to hold, by the said abbot and convent, and their successors in perpetuity from the said William and his heirs, all the said windmill, with the said soke, together with that plot of land on which the said windmill is situated: Also with liberty to dig soil round about where the said William has been used to do and carry it away for elevating and exalting the site of the windmill as may be necessary: Also with a plot of land, outside the site of the mill, for winnowing grain in the wind, where William and his men have been used to winnow: Also with liberty of coming and going to and from the site, with oxen and horses carrying millstones or structural timber, and for other traffic, by the roads and lanes by which the said William and his men have been used to come and go: Also with all liberties, appurtenances, and commodities, to the said windmill belonging. The abbot and convent rendering annually therefor to the said William and his heirs nothing save prayers and orations, except all those liberties in the said mills fully to him and his heirs as above stipulated. For this concession of the said mill, with all its appurtenances as above stated, the religious men aforesaid have given to the said William by hand ten marks [£6, 13s. 4d.]. In testimony of which, &c.

Recognitio de secta ad molendinum de Ynes.

Ibid., II. 511.

Magne discretionis viris dño Henrico de Lee vicecomiti Lancastrie iudicatoribȝ eiusdem comitatus Willmus Knotte Alanus le Juene Gilbertus Blanchard Ad de Crosseby Henricus filius Willmi, Petrus de Leylondeschir, Robertus de Pekko, Robertus le Chanon, Alanus frater eiusdem Roberti, Symon filius Ade, homines Willmi Blundel dñi de Ynes in Derbyschir in dño salutem.

Nouerit discretio vestra quod nos omnes et singuli facimus Petrum de Laylond attornatum et procuratorem nostrum ad faciendum finem coram vobis in comitatu de misericordia quam incurrimus ex de faltis quas fecimus in placito quo implicabamur p abbatem de Stanlawe de secta ad molendinum suum in eadem villa de Ynes. Recognoscentes nos etiam heredes nostros imppetuum dictam sectam facere debere ad dictum molendinum de omnibȝ bladis que crescunt in villa nostra antedicta ad sextum decimum veras ac firmum et stabile habituros quicquid idem Petrus coram vobis nomine nostro duxerit in hac parte faciend.. In cuius rei &c. Valete in dño semper.

Data apud Ynes anno dñi m° cc° octog. tertio die sancti Mathie apostoli.

Recognition of the soke of Ince mill.

The great and discreet men the Lord Henry de Lee, Sheriff of Lancaster, and the justices of the said county, We, William Knotte, Alan le Jeune, Gilbert Blanchard, Adam de Crosseby, Henry, son

2. Ince Soke Deeds.

of William, Peter of Leylondshire, Robert of Pek, Robert the priest, Alan, brother of the said Robert, Simon, son of Adam, men of William Blundel, lord of Ince in [West] Derbyshire, salute in God.

Be it known to you that each and all of us have appointed Peter of Leyland our attorney and pro-curator to answer on our behalf before you in court for what penalty we have incurred for the default we have committed, and with which we are charged in the pleadings by the Abbot of Stanlawe respecting the custom to his mill in the same town of Ince. Recognising that we and our heirs should render the said custom to the said mill in perpetuity regarding all grain that is grown in our town aforesaid, paying the sixteenth vessel [as toll]: we shall abide firm and constant by whatever the said Peter appearing before you on our behalf in this matter may do. In testimony of which, &c. Farewell in God ever.

Done at Ince, St. Matthew's Day (24th February), anno domini 1283.

To these early instances of soke privileges of windmills may be added the later legal statement of Chief-Justice Fitzherbert, who, in the reign of Henry VIII., explicitly defined a soke mill by reference to a windmill:—"A windmill whereunto all the lord's tenants are bound to grind all their corn and malt that they occupy of their own at the said mill, as well free tenants as other."

Boke of Surveying, 1538.

CHAPTER XV.

THE TRIPOD POST MILL.

XV. THE TRIPOD POST MILL.

1. The Primitive Type.

1. THE method of construction of the original windmill is a matter of some conjecture. One or two archæologists have stated as fact what seems, in the apparent absence of definite evidence, to be mere matter of conjecture, that the first windmill was built upon a boat. It is quite certain that the initial difficulty of building a mill, driven by wind, that would be capable of keeping at work from whatever quarter the wind might blow, must have proved a problem that in the early ages remained insurmountable. It may probably be, therefore, that the difficulty was eventually obviated by adopting the expedient — derived from floating or boat mills—of placing the mill upon a moored boat, which might at will be turned to meet the varied currents of the wind. Still, we find no reliable evidence in support of the presumption, nor a single delineation of any such windmill in the many early illuminated MSS. in which mills are represented. The earliest allusions to windmills distinctly represent them as erected on land, and we believe, in fact, that before the first one was built, the problem of keeping them workable by any wind had been solved. The most ancient specification of a windmill of which we are aware is practically that of the form of the machine seen commonly at work at even the present day, and known as the "post mill" or the "peg mill."

This primitive variety was a very inconsiderable

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1. The Primitive Type.

structure of timber, which (shortly before the date of the earliest sketch showing a mill of which we are aware) is described in the Oleron Laws adopted in England about the year 1314:—"Some windmills are altogether held above the ground, and have a high ladder; some have their foot fixed in the ground, being, as people say, well-affixed." Two varieties of mills seem here to be clearly specified—one having its foundation upon, and the other beneath, the surface of the ground. Of the two, the first appears to be the more primitive. A small box-like edifice was built round a central post or shaft, the lower end of which was fitted into a timber foundation laid upon and pinned down to the ground; the entire mill being turned round to suit the various changes of the wind. We have been at some pains to trace, in early MSS. and elsewhere, delineations of these primitive structures; but nothing seems to occur on the point earlier than the year 1349, or one hundred and fifty-eight years after the erection of Dean Herbert's mill at Bury St. Edmunds. Several of the more interesting sketches which we reproduce will be seen to agree exactly with the specification of the Laws of Oleron, and at the same time to tolerably well bear out the regretful remark made by Strutt over a century ago:—"All the mills, especially windmills, which appear in the ancient MS. delineations, are represented in the distance, or are so very small that their particular form and appurtenances are not to be discovered." As a rule, the sketches appear in no more enlarged proportions than that in the painting we reproduce on an earlier page, or those illustrated in the same size as the originals a little later in the present chapter.

Hord. Ang. Cyn. 1775, II. 14.

Text: p. 225.

2. Engraved Brass.

2. The earliest representation in this country of a windmill which may approximately be dated, appears to be Flemish, and to occur on an engraved brass,

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2. Engraved Brass.

marking the tomb of Adam de Walsokne of Lynn, Norfolk, who died in 1349. The brass is one of the six great Flemish memorial brasses of early date remaining in this country, measuring 68 by 48 inches; but the mill occurs in the representation of a rustic scene in a panel under the feet of the large figures of Walsokne and his wife. The whole brass is engraved in Cotman's "Sepulchral Brass in Norfolk" and Waller's "Monumental Brasses"; a photo-lithograph of the panel as drawn by Cotman, and published by Mr. E. M. Beloe, King's Lynn, showing the subject

Engraved Brass at Lynn, A.D. 1349.

tolerably clearly. Mr. M. Stevenson, who has favoured us with a copy of a rubbing of the brass, informs us that the latter is rather worn, and in the rubbing, as will be seen, the mill does not come out well; but the general features of the structure, its tripod foundation and low elevation, are all clearly perceptible. The rustic scene in which the mill appears is of a somewhat doubtful character, but is generally considered to depict a procession in connection with rural sports. Cotman observes that the story depicted in the panels is "perfectly unintelligible." According to Waller, the figure on the horse is that of a man carrying a sack of corn on his shoulders to avoid fatiguing his horse—a witticism, upon the presumed simplicity of the Norfolk man thus ambling to market daily with his lolis or common grain, that is even a couple of centuries older than the date of the brass:—

Early Mysteries. Wright: Lond. 1835.

Ad forum ambulant diebus singulis
Saccum de lolis portant in humeris
Jumentis ne noceant.—*Descriptio Norfolciensium.*

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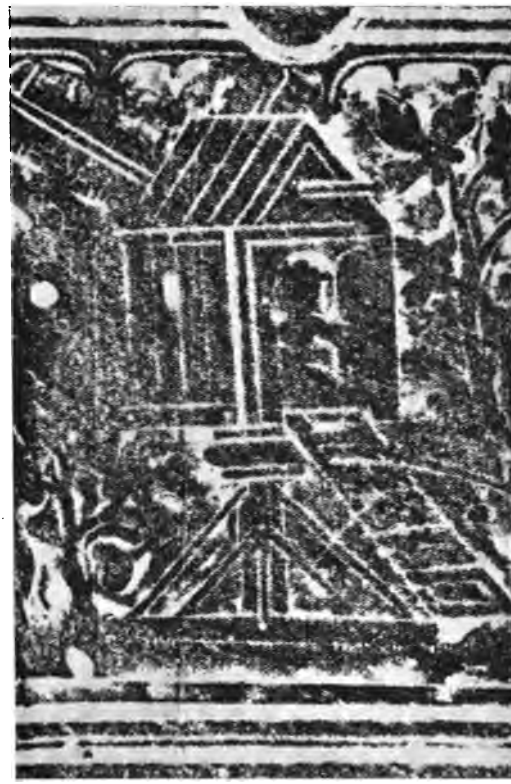
2. Engraved Brass.

However this be, the mill seems to be purely a conventional item of ornamentation, and to have no practical reference to the career or avocations of Adam



Rubbing from engraved brass at Lynn.

de Walsokne, erstwhile merchant and mayor of Lynn. Mr. Harold Broderick informs us of a painting of a mill, presumed to be of the fourteenth century, in the east window of Corpus Christi Chapel at Fairford Church, Gloucestershire.

3. Fourteenth Century Drawings.

3. A book of Decretals, of the fourteenth century, in the British Museum, contains several representa-

XV. THE TRIPOD POST MILL.

tions of mills introduced as mere elaborations of grotesque marginal decorations. In each case the mill is

3. Fourteenth Century Drawings.

Roy. MSS. 10 E. IV. 89.

From Fourteenth Century MS.

seen to be supported on a central post raised well

Ibid., 115.

From Fourteenth Century MS.

3. Fourteenth Century Drawings.

above the ground; these indeed being the most distinct (though not the most correct) ancient representations of the structure we have been able to discover. While in the first sketch the mill is very conventionally treated, more complete details appear in the others, showing the beam by which the mill was turned, and the step-

Ibid., 70ᵇ.

From Fourteenth Century MS.

ladder by which it was approached; also, in one case, the trestle foundation. But in the matter of founda-

Ibid., 114.

From Fourteenth Century MS.

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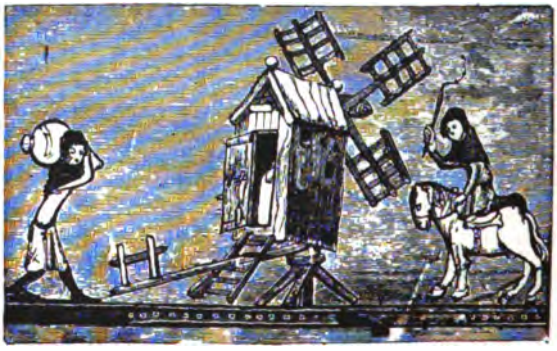
3. Fourteenth Century Drawings.

tion beams all four sketches are of very doubtful accuracy; that actually showing them representing them as raised above the ground; and the others showing no foundations whatever, though there is no reason to presume them to be sunk in the ground. The beam in each case also appears as though fixed to the pin or peg instead of to the mill itself; but there is no evidence that the peg was ever made to turn, and the irregularity with the others noted may perhaps safely be considered as mere inaccuracies of an artist who could depict figures standing or walking on the beam of a mill.

A mill of the same type, from a MS. of the same century, the reference to which does not appear to



From Fourteenth Century MS.

be given, appears in the illustrated edition of Green's "History of the English People," 1892.

4 Fifteenth Century Drawings.

4. A MS. copy of Boccaccio's "Decameron," dated 1409, in the British Museum, affords the next illustration in point of date, the mill occurring as an incidental part of a landscape, and being much more crudely indicated than the one upon the brass. The sketch, which is reproduced in the exact size of the original, shows the structure to be without a visible tripod foundation, and either the artist drew with indiffe-

XV. THE TRIPOD POST MILL.

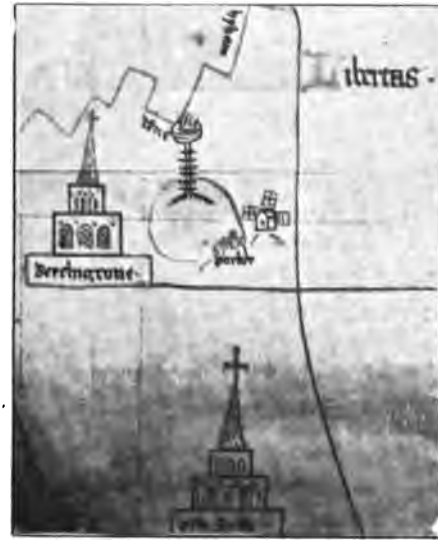
4. Fifteenth Century Drawings.

Roy. MSS., 20 C. IV., 160.

rent care to accuracy or purposely omitted the tripod beams as being invisible at an extreme distance. In any case, this does not represent a mill with a fixed tower, as is evident from the centre of the sail arms being rather within the body of the mill than in the cap or gable; the drawing bearing a strong resemblance in this respect to several others noted later.

From Miniature, 1409.

In 1414 the map of Thanet by Thomas of Elmham, already mentioned, contained in a MS. preserved at Trinity College, Cambridge, clearly depicts the mill as built upon the tripod foundation.* Text: p. 226.



From Map of Thanet, 1414.

A vellum roll containing a plan of the estate of the Carthusian Monastery, London, compiled in 1430, indicates the mill of the monastery; of the site of

* A map of Thanet, at the close of the last century, still shows a windmill on the medieval site at the foot of the beacon mound at Birchington. Hasted's Kent, 1799.

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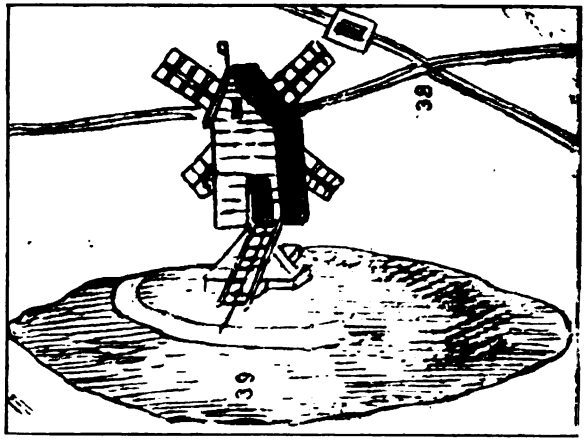
4. Fifteenth Century Drawings.

which the Windmill Inn in St. John's Street was, and perhaps still is, considered to be a remembrance. The mill is described in the key to the plan, "the myll hill in ye commaunders mantillis." On an



From Plan of Carthusian Monastery, London, 1430.

adjoining plot is indicated a destroyed mound, the site of a still older mill, and described, "This myll hille in ye nonys [nun's] felde of Clarkynwell is [now] made playne wt the felde."

"The most perfect delineation of an ancient windmill I have ever seen," Strutt decides to be a small drawing of one at Paris, appearing in the Life of Beauchamp, Earl of Warwick, who flourished towards the end of the fourteenth century. A sketch of the drawing, reproduced by Strutt, very indistinctly, after all, represents the mill: which, he says, still "agrees entirely with every other delineation of a windmill." Reference to the MS. itself—which was written by John Rouse of Warwick about 1450—shows the original to be by no means so clear an illustration as Strutt ingeniously has elaborated from it. Rouse, like other medieval artists, doubtless vaguely sketched

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Century
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Strutt's Sketch from Rouse's MS. Life of Beauchamp.

Horda Ang.
Syn. II. 14.

the mill according to his idea of mills of his own day: and this Parisian mill, attributed to the fourteenth century, most probably, therefore, represents some Warwickshire mill of the fifteenth century. In passing, it may be noted that Rouse seems to have been perfectly correct in introducing a windmill in his view of Paris, for though the city chiefly relied upon the mills under "Miller's Bridge" across the Seine, still one or more windmills figure very prominently in most of the later views of Paris down to the last century.

Various undated MSS. of the fifteenth century contain minute representations of windmills appearing on the summits of hills in the extreme distance of the

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4. Fifteenth Century Drawings.

Cott. MSS., Jul. E. IV. art. 6.

Rouse's Original Sketch: Fifteenth Century.

views; all of which illustrate, though occasionally not very clearly, the same continuous style of building. In a superb MS. of the Bible containing some of the most elegant miniatures of the period, preserved in the collection at the British Museum, are several sketches of windmills. One of the most perfect appears in a scene representing the finding of Moses, the tripod being distinctly shown; another, in which the tripod foundation is partly shown, occurs in a very carefully elaborated miniature in the Book of Joshua. A third is of the ambiguous form already illustrated by

Roy. MSS.: 18 D. IX. 109.

From Fifteenth Century miniature, "The Finding of Moses."

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4. Fifteenth Century Drawings.

Ibid., 275.

Fifteenth Century Miniature (The Book of Joshua.)

the sketch from Boccaccio, the tripod foundation being omitted from the sketch as invisible, but the mill, like the rest, being covered by a fixed gabled roof. Of precisely the same form is a mill in a fifteenth century MS. at Lambeth Palace;[1] but, on the other hand, this MS. also contains a sketch identical with that in the first of the Biblical scenes just mentioned, the tripod being clearly shown.

Ibid., 173.

Text, II. 249.

From Fifteenth Century Bible.

[1] Chron. St. Albans: ff. 33, 125.

From Fifteenth Century Monastic Chronicle.

A mill of a somewhat problematic form occurs in a miniature, also of the fifteenth century, *Les quatre filz D'Aymont*, in the British Museum, the structure appearing to possess, even more distinctly than appears in our drawing, a fixed circular tower, as does that in the miniature reproduced on an earlier page. Clearly, however, this peculiar aspect of the structures is due to their being represented at a distance, where the details of

Roy. MSS.: 16 G. II. 22.

Text, II. 251.

From Fifteenth Century Monkish History.

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4. Fifteenth Century Drawings.

their foundations would be invisible. The sailyards in each case are perceived to centre in the middle of the mill; so that these latter were not intended to represent tower mills; and it is possible they may indicate peg mills built upon mounds of earth or stone, as described in another chapter.*

5. Sixteenth Century Drawings.

5. The somewhat indistinct character of the early representations we have reproduced may advantageously be compared with a sketch stated to be taken

Illustrated Exhibitor: London 1852, 310.

Post Mill as Bolted to the Ground: Sixteenth Century.

from "the most ancient treatise on geometry, which was printed in France in 1511 or 1512;" showing the tripod foundation to be bolted or spiked to the ground; and the mill to bear a close similarity to

* The smaller of the foregoing illustrations from the illuminated MSS. are from drawings by Mr. E. W. Cox; the whole of the others being from photographs from the various MSS., specially taken for this work by Mr. E. Dossiter of the British Museum. As, with two or three exceptions, these drawings are not included in the printed subject index to illuminated MSS. in the British Museum, the references we have given are indispensable to any one desiring to see the originals.

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the Carthusian mill in London already represented. This sketch, exceptionally clear and distinct, was ere long followed by a diagram, illustrating the working of mills, by Olans Magnus, from whose "History of Northern Nations," published in Italian at Venice in 1565, our photograph is taken.* Magnus, referring to the different kinds of mills then in use in the North, alludes but scantily to the windmill; which, he says, is usually built on uplands, and turned by heavy winds issuing from the hollows of the mountains, though it is erected very commonly in Holland also for irrigation purposes. His sketch shows the east and west winds appearing to blow the water towards

5. Sixteenth Century Drawings.

Diagram of Mills—Magnus, 1567.

Hist. Gent. Septen.: Venice 1565, XIII. xi.

a watermill (containing a hopper but no stones) while on hills in the distance are two windmills far more crudely drawn than in many of the earlier illuminated MSS. In the Latin edition the corresponding diagram is rather better drawn, and the windmill is very similar to that of Rouse, as reproduced by Strutt.

6. Contemporary with Magnus was the travelled

6. Specification by Cardanus.

* The Latin edition of 1567 contains a dedication dated 1555, while a passage in Lib. XIII. cap. x. incidentally suggests that the chapter in question was written in 1525.

XV. THE TRIPOD POST MILL.

6. Specification by Cardanus.

philosopher Cardanus, who gives us a technical specification of the method of constructing the windmills we have so fully described from pictorial representations. Cardanus had visited most parts of Europe, including England, France, Germany, and Italy; yet strange to say he speaks of the windmill as a marvellous novelty—something scarcely to be described without arousing incredulity, a contrivance in use in Italy and France alone. This extraordinary prologue to his specification of the mill was published in 1557, or over 350 years after the date of the mill of Dean Herbert of Bury St. Edmunds, and at least two centuries after the period when windmills were common throughout England and Europe. Still, though the machine was a novelty to him, he describes its method of construction and principle of working with tolerable accuracy.

De Rerum Varietate: Basle, 1557, I. 10.

Neque præterire quod adeo est admirabile, ut antequam viderem, credere non potui, neque narrare quod tam vulgatum est absque levitatis crimine possum. Sed vincant jam studia sciendi verecundiam. In Italiæ igitur non paucis regionibus et in Gallia passim molendina sunt, quæ ventorum flatibus circumvertunter. Atque adeo vehementi impetu, ut tres equos cum equitibus circumnagere possent. Adeoque præsent utilitate ut modios viii Mediolanensis in singulas hords id est libras circiter tria mille frumenti molere possint. Tanta vero industria fabricatum hoc opus est ut cum cessat etiam ventus quasi sponte adhuc circumvoluatur. Cum multa videssem unius tantum quod juxta sanctum Maturinum vidi diligentius, dum iter istud diuturnum ad longissimum peragos pro exemplo machinæ enarrato sufficiat. Statuatur rectus cardo multisque tignis suffultus A B, super hoc machinia tota trusatilis cõstituatur. Tignum è regione januæ C D quo tota machina ad libitum circumvertitur. Sic vero aptatur ut ventus ex obliquo non a fronte nec a latere petat. Pinnas affixas intrusasque trabi rotundæ E F ex adverso januæ prominenti atque versatili. Pinnæ igitur binæ ac binæ e directo sibi junctæ sunt, parumque distantes invicē, non tamen eidē

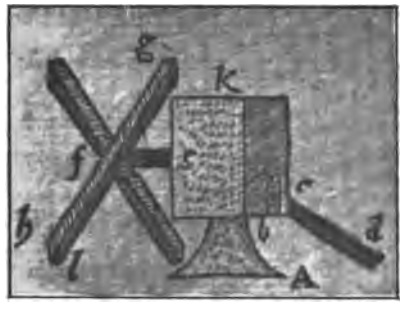

Diagram of Windmill—Cardanus, 1557.

XV. THE TRIPOD POST MILL.

6. Specification by Cardanus.

trabis loco infixe, prominent ad terram usque fermé, tanta est longitudo illarum. Quælibet ex duabus superficiebus constat quarun singulæ quatuor aut quinque continēt latitudinis palmas, velaque extensa cōplentur. Superficias vero superior G H retrorsum respicit paululum ut anterior K L est æquidistans superficiei postremæ machinæ. Cum igitur aër premit superiorē pinnarū superficiē quæ æqualis est inferiori, tota rota atque cum eô rotæ aliæ quæ intra machinam continentur circumaguntur. Nam si primæ ad perpendiculū erigerentur supra machinæ superficiem et secundum E F longitudinem sic ut ventum exciperent, quemadmodum et rotæ aquarum et vela, tantum haberet impedimenti rota ex superiore pinna, quantum impetus ex inferiore.

Hæc igitur diligentius explicasse volui: cæterum si quis exquisitam constitutionem et machinæ īconē desiderat, librū Hieronymi Giravæ Hispani hac in materia absolutissimum revolvat.

Nor can I pass over a thing which is so wonderful that I could not believe it before I saw it, nor tell what is so commonly known without incurring the charge of levity. But let the interests of science overcome the scruples of shame. There are now in parts of Italy and France, in many places, windmills which are turned by the wind, and with such force that they could carry round three horsemen, horses and all, and they are so effective that they can grind seven Milanese bushels, that is to say, three thousand pounds of corn per hour. But so ingeniously is this machine constructed, that even when the wind drops it goes round spontaneously. Though I have seen many, yet one which I examined more carefully near St. Maturin when daily making that journey, may suffice as an example of the above-mentioned machine. Let the upright hinge A B, supported by many beams, be set up. Upon this let the whole mill be placed. There is a beam in a line with the door C D, by which the whole machine can be turned round at will. But it is so contrived that the wind catches it at an angle, not in front nor broadside-on. It has sails fastened and inserted into the round beam E F, facing the aperture which projects and is moveable. So there are a pair of sails and another pair at right angles joined together, and at a short interval from each other, not however fixed to the same part of the beam. They project generally right down to the ground, so great is their length. Each (sail) consists of two surfaces of which each pair have a breadth of from four to five palms, and the sails spread out are filled (by the wind). Now the upper surface G H looks back a little as the anterior, K N(?) is equidistant from the rear surface of the machine. When, therefore, the air presses upon the surface of the sails which is equal to the lower, the whole wheel, and with it the other wheels which are contained inside the machine, are driven round. For if the first were erected perpendicularly above the surface of the machine, and following the length of E F so as to catch the wind, like water-wheels and sails, the wheel would meet with as much resistance from the upper sail as there was force exerted by the lower.

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I have therefore wished to explain these points with greater exactness; but if any one desires a perfect construction and a picture of the machine, let him refer to the work of Jerome Girava the Spaniard, which is most perfect on this subject.*

7. Lord Bacon's Theories.

7. A little over half a century later than Cardanus no less a dignitary than Lord Bacon endeavoured, but without conspicuous success, to diagnose the theory of the action of the windmill:—

Historia Ventorum, 1622.

1. There is nothing very intricate in the motion of windmills, but yet it is not generally well demonstrated or explained. The sails stand right opposite the wind that is blowing, one side, however, turning more to the wind; and the other gradually inclining and receding from it. The revolving motion always commences on the lower side, that is, the one furthest from the wind. The wind rushing against the machine is compressed by the four sails and compelled to make a passage through the four openings between them. But this confinement it does not willingly submit to; so that it begins as it were to jog the sides of the sails and turn them round, as children's toys are set in motion and turned by the finger.

2. If the sails were stretched out equally it would be uncertain to which side they would incline, as it is a question which way a stick would fall. As, however, the side which meets the wind throws off the force of the wind to the lower side, and thence through the vacant intervals; and as the lower side like the palm of the hand or the sail of a ship receives the wind, the rotation forthwith commences from that part. But it should be observed that the origin of the motion is not from the first impulse (that which is made in the front), but from the lateral impulse after compression has taken place.

3. I have made several trials and experiments for increasing this motion, both as a token that the cause has been well discovered and for present use; contriving imitations of the motion by means of paper sails and the wind from a pair of bellows. Accordingly, to the lower side of the sail I fastened an additional fold, turned away from the wind, in order that the wind being now directed from the side might have a larger surface to strike against. But this did no good, for the extra fold did not so much assist the percussion of the wind, as it impeded the cutting of the air by the sails. At some distance behind the sails, and the whole breadth of their diameter, I placed obstacles in order that the wind, being more compressed, might strike with greater force; but this did more harm than good, as the repercussion deadened the primary motion. Again, I made the sails double their former width in order to compress the wind more and the lateral percussion stronger. This at least was com-

Biog. Gen., Paris, 1857.

* Of Jerome Gerava little is known save that, as Didot states, he published *La Cosmographia y Geographia* at Venice in 1570, which, though printed in Italy, was, as Cardanus states, a Spanish work. As he mentions it in 1557, the edition of 1570 mentioned by Didot cannot have been the first.

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7. Lord Bacon's Theories.

pletely successful, for the sails were turned by a much gentler blast and revolved much faster.

This increase of motion will perhaps be produced more conveniently by eight sails than by four sails of double breadth, unless by chance the weight should be so great as to impede the motion. But of this make a trial.

The length of the sails likewise contributes to motion. For in rotations a little force towards the circumference is equal to a far greater force towards the centre. But to this there is one drawback, namely, that the longer the sails are the further are they separated at the top and the less is the wind compressed. It might perhaps answer to make the sails a little longer, but widening at the top like the blade of an oar. But of this I have made no experiment.

Admonition: If these experiments be put in practice in windmills, the whole machine, especially its foundations, should be strengthened. For the more the wind is compressed (though it increase the motion of the sails) yet the more does it shake the whole machinery.

The fallacy of Bacon's theory is fully exposed in the brief editorial criticism of Leslie Ellis :—"What is said of windmills seems to be derived from Bacon's own observation: it cannot be said that it is of much value. It did not occur to him to try whether a windmill with one sail only instead of four would remain stationary, as on his theory it plainly ought to do. On the other hand, he increased the number of sails, and ascribed the increased speed of the mill to the increased compression of air between the vanes. That the whole amount of surface exposed to the wind was increased seems to have been forgotten."

Wks. of Ld. Bacon; Spedding, 1877, v. 185.

Till modern times philosophers failed to adequately formulate a scientific theory for the action of a windmill; still the millers themselves had, ages before, thoroughly understood the theory and reduced it to practice, and Fontenelle's pertinent remark upon the fact, as stated by D'Aussy (1782), may here close the subject :—"The position of the sails is not a matter of indifference. If they are placed perpendicularly to the axis they would present to the wind only an obstacle that would be broken every time the wind had sufficient force. If they are placed too obliquely the wind

Hist. de la Vie Pr.: 1815 ed., I. 64.

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7. Lord Bacon's Theories.

will glide over them without moving them. It is necessary, therefore, to give them a certain degree of inclination, and this was a fixed point which it was difficult to discover. . . . A mathematician of the eighteenth century, a member of the Academy of Sciences, not doubting but that ignorant workmen, such as those employed in the construction of windmills, could not be well posted up in a theoretical matter of this scientific character, resolved to investigate himself to what precise degree the sails should be obliquely placed. After many calculations and complicated investigations, he discovered that it was necessary to do precisely that which was already being done by the mill makers. Fontenelle, the historian of the Academy, appropriately observes that if, in this respect, it may be regarded by savants as a matter of jealousy, that there should have come into existence so perfectly arranged a machine in which science has had no part, and to which, up to the present, it has added nothing—si parfaite où la science n'a point eù de part et où jusqu' ici elle n'a rien ajouté—still scientific men may console themselves, for they, at all events, are the sole persons who have been able to fully assure themselves that it really is perfect."

8. Erection near Watermills.

8. A noteworthy circumstance in connection with the introduction of the new type of mill was its constant erection in close proximity to old watermills, when the conditions of site suited. An owner of milling rights, in concentrating his entire establishment, both wind and water power, on the one spot, would primarily be influenced by considerations of convenience; but it was also obvious that such an arrangement permitted of considerable economy in working expenses. Neither type of mill could be relied upon for continuous working. "Sometimes the watermill was short of water, and the windmill scant of wind"—as tenants absenting themselves from their lords' mills are often found pleading

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8. Erection near Watermills.

in the courts. It was therefore not only an advantage to an owner to possess both kinds of mills, so that one might work when the other was compulsorily idle, but it was otherwise a profitable arrangement, in that the close juxtaposition of the mills enabled one set of millers to work either mill as required, which was as near an approach to an actual combination of windmill and watermill in one building (such as we have instanced at Tycroes, Anglesea) as the mechanical efficiency of the age permitted. At Meaux Abbey, Yorkshire, between the years 1249–1269, a windmill was located beside a watermill, the careful monks calculating that their one miller and his man could work them both. About fifty years before, the abbey mill, together with an adjoining granary containing 100 sextars of grain, had been burnt, and though the mill had been rebuilt, still further resources had become necessary :—

After this, when the said John of Oxford, Chancellor of York, was removed from that position, and William of Wykwan was appointed to his dignity and office, we attempted to erect a watermill at Wagnam, at the head of our dyke there. Now there already was within the abbey precincts one watermill, covered with a leaden roof, on the western side of the great granary, beside the outer gate in the wall, having a pool in common with the stable; and to this the water from the marshes ran from Lambwath, by way of the Monk's Dyke, on the eastern part of Eastwood, this dyke running under the bridge near the chapel in the wood. After passing through and serving the monastery grounds, the water flowed away by the dyke of Eschedyk, and joined the river Hull. But the free passage of this watercourse from Eastwood to the abbey had been seized and hindered, so that the abbey mill, by reason of scarcity of water, was reduced to no value whatever. Thus the building of the new mill was under the consideration of Abbot William; but, before anything was done in the matter, we erected a windmill in Stannkerre fields (near the site of the new mill), so that one miller with his boy easily might concurrently manage both, and grind the grain of ourselves and others, by either wind or water: ut unus molendinarius cum pagio quo utraque molendina facilius conservaret, nostraque grana et aliorum ventis et aquis concurrentibus liberius pariter molerentur. Chron. Mon. de Melsa, II. 82.

William, Chancellor of York, having sold to his free tenants, as common pasture, the fields in which the windmill was erected, ordered it to be pulled down: but subsequently, for himself and his successors, agreed that on our paying five shillings a year to his

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church of Wagnam, we might retain the mill there, contiguous to our new watermill, as under the same roof; and have the use of the water of the dyke of Eschedyk: which dyke, both then and before that time, was known as Monk's Dyke; nothing in the agreement to be to the loss or prejudice of the chancellor; inundation of pastures and arable lands surrounding the mills to be prevented; and in the event of our no longer requiring the mills, and giving up their use, the payment of five shillings per annum to cease. However, after this was agreed to, and we had expended considerable sums in establishing the mills, our original purpose was frustrated, for of late years no water at all, during the summer season, reached the mills, and we were deprived each summer of all chance of working them by the water from Monk's Dyke. For this reason, the turbid water of the dyke joining the Hull had to be utilised, with the result that after it had been retained by the mill it passed away to the river in a purer state than it had been at first; the dyke becoming choked up with the deposited mud, and having to be cleaned out every ten years or so at great expense. It has, in fact, been calculated for the present year that, what with the rent of five shillings, the cost of repairing the mill, and the expense of cleaning the dyke, the supposed benefit of the free use of water from Monk's Dyke is much more than absorbed. And, after all, the Lord Simon the Constable, who has free tenants in Beningholm, has laid vehement complaint against us for inundating the lands of his tenantry in the towns of Beningholm and Arnallia by water flowing thither from the dyke; so that, to quieten the calumny, we have agreed to build a dam, which may be opened and closed as required, in order that neither the retention nor the overflow of the water shall in any way injure his tenants.

This early instance, which we have quoted in full, in illustration of the milling troubles of the monks, may very commonly be found followed till modern times. In the same spirit of economical management, Moore, of the seventeenth-century Townend post mill, Liverpool, advises his son—"Cause another windmill to be erected, for you will need but one carrier and one horse to them both, and a miller and a boy of a cheap wage."

The old watermill and tower windmill of Lord Cholmondeley, at Helsby, Cheshire, still standing side by side, illustrate the perpetuance of the custom till recent times; when at most old-established milling centres, as, for instance, Bootle, near Liverpool, the two kinds of mills were ordinarily found built in close proximity.

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8. Erection near Watermills.

Watermill and Windmill, Helsby, Cheshire.

9. Modern Survivals.

9. The uniform general character of these primitive structures has been so strictly maintained during succeeding ages—a valuable testimony, by the way, to the excellence of the plan upon which the mill was originally constructed—that even in the present day the shires are thickly dotted with post-mills in no material degree differing, except in size, from the mills of Norman times. If many of them are mere decaying silent emblems of the past, yet many others—generally engaged in the occupation, important though less dignified than of yore, of grinding food-stuffs for cattle—are full of life and activity, and often thriving under the adverse condition of affairs.

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Baxterley, Warwick.—*Photo. by W. G. Chambers.*

Their capacity, of course, varies mainly according to their sail-power; but considering the average length of sailyard from tip to tip to be from 50 to 60 feet, an average of the output may be obtained with very tolerable approach to accuracy. We have made many inquiries respecting post-mills of the size in question, a good specimen of the class being that of Bozeat, Notts, thoroughly ancient in type, but perfectly modern in equipment. This mill, with a steady wind, will grind about twenty quarters of grist for cattle per working day, or on "a very windy day," as much as twenty-four quarters of 480 lbs. Fishbourne mill, illustrated later, ground during many years after its removal, and until its recent destruction, from sixteen to twenty bushels of grist per hour with one pair of stones running. Rustington, also illustrated, with two pairs of stones, grinds up to twenty bushels of corn per hour. At Avon Dassett (War-

Bozeat, Northampton.—*Photo. by A. Norman, Northampton.*

wick), the late miller informs us, indeed, that "as the wind is never regular," he has ground with one of the two pairs of stones (though the mill could drive both if she got the wind-power) in an hour "from a gallon to a sack, more or less; perhaps a sack one hour and a bushel the next, or even a gallon, or none."

At Stockton, another of the old midland post-mills, but at present unoccupied and threatened with demolition, it was possible to grind, with a fairly steady wind, very lately six bushels of 60 lbs. per hour with one pair of stones (there being here also two pairs, one for wheat and one for grist); though some years ago, when in fairly regular work, an average of nine

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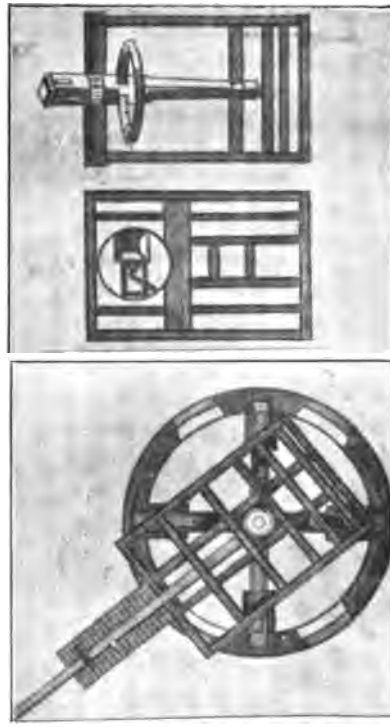
bushels per hour was not considered uncommon. Mr. Alfred Herring, tenant of Little Dassett post-mill, near Leamington, the property of Lord Willoughby de Broke, kindly sends some interesting details of the capacity of that mill. "The mill is well exposed to the south-west winds upon high lands overlooking a beautiful valley, with the Malvern Hills in the distance clearly visible on a fine day. There are two pairs of stones, one 4 feet 6 inches in diameter, for barley, oats, beans, and Indian corn, but not much used; the other 4 feet in diameter, for wheat. The wheat now is chiefly from the allotment holders in the villages of Northend, Fenny Compton, Knighteote, and Avon Dassett. I have worked the mill myself three and a half years, and consider that in a good fair wind, and with one pair of stones, twelve bushels of mixed grist for pigs' food can, on an average, be ground in one hour. Wheat for bread takes longer, and the average is from six to eight bushels per hour. The most I have ever ground in a day (thirteen hours, on October 22, 1898, with a south wind) was ninety bushels of barley, wheat, and beans for pigs' food; and thirty bushels of wheat for bread. The least time in which I have ground three bushels of wheat for pigs' food was ten minutes."

At the ancient Wavertree post-mill, near Liverpool, about twenty years ago, when it was finally closed, the average output with one pair of stones was also six bushels of wheat, or eight of general grist, per hour. Formby post-mill (blown down in 1883) was fitted with one pair of stones till the year 1868, these being 4 feet grey stones used for shelling and grinding oats for pigs' food, and capable of turning out, with a steady wind, from four to six bushels per hour. When wheat-grinding was started at this mill, a pair of French burrs, 3 feet 6 inches in diameter, were installed, their average output with a fair wind being

from three to four bushels per hour: with a high wind, both pairs could be driven to turn out a total of nine bushels. Mr. J. Leadbetter, who informs us of these particulars, has worked as a miller since his boyhood, and is now seventy-three years of age: he remembers Formby Mill for over sixty years; but has also tenanted the post-mills of Ainsdale and Churchtown, Lancashire, both of which were similar structures to that under notice.

The modern post-mills are usually three-storey erections; the lowest floor (immediately beneath which the beam for turning the structure is attached) being the general receiving and despatching room, and



containing the bolters; the second floor containing the hopper and stones; and the third the sail beam,

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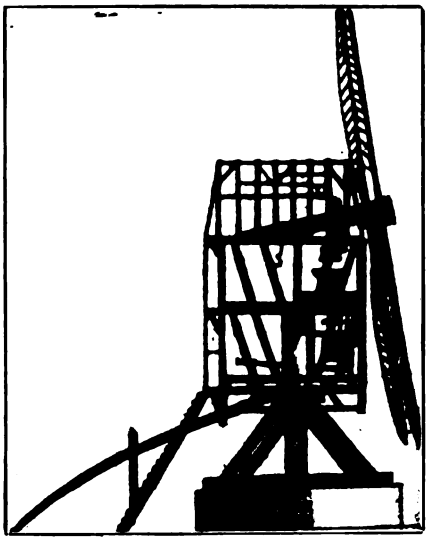
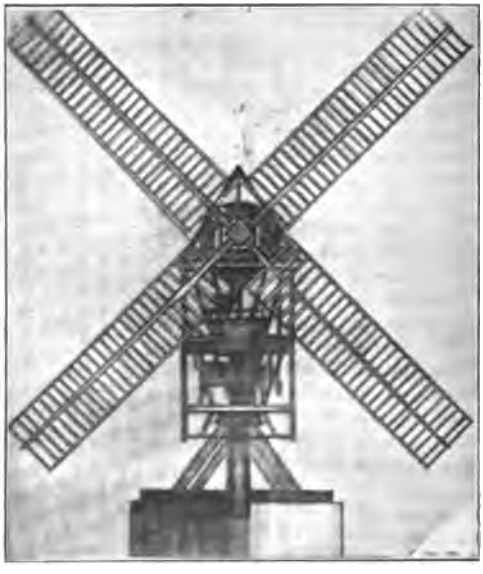
together with the gear connecting it to the downward shaft which drives the stones. In the sectional dia-



grams the central peg or pillar is perceived not to be



placed exactly in the centre of the edifice: the rear

portion of which is the larger of the two, and not only serves by its greater capacity to give accommodation for working and storing, but affords, by its proportionately greater weight, a counterpoise to the fore part bearing the sail beam and the entire machinery of the mill. The obliquity of the sail beam and arms, also—the importance of which Cardanus and Bacon were among the earliest to point out—will be observed more clearly from the diagram than from any of the photographs of existing mills.

Though many of the antique structures, restored and rebuilt time after time, still remain scattered through the shires, perhaps in none of our towns has one existed for at least a century past. Naturally the heavier and more exacting demands of large centres of population have inevitably led to the extinction of the earlier and ruder forms of mills: yet it was in such primitive structures and with such simple machinery that the nucleus was established of many a thriving milling centre of the present time. The gigantic grinding trade of Liverpool of to-day, founded to a great extent in ancient mills of this type, was largely carried on in them till even the last century, though many tower mills had already begun to usurp their place. The last of the King's Soke Mills of Liverpool was a tripod structure, standing near the site of St. George's Hall, which was pulled down by the corporation in 1780: near by, on a site absorbed by the last extension of Lime Street Station, was a similar structure, known as Tyrer's Mill, which was blown down in 1793: and in the northern suburbs was Spellow Mill, of the same type, which existed till 1828, when it was burnt down.

Text: Vol. IV.

CHAPTER XVI.

REMOVALS OF TRIPOD MILLS.

XVI. REMOVALS OF TRIPOD MILLS.

1. Laws of Oleron.

1. THE primitive peg mill was early found to be readily removable from place to place. Various reasons for altering the locality of a mill arose from time to time; the principal being the possibility of obtaining a more exposed site, or a more advantageous position near a main road. The laws of Oleron—the enterprising little commercial community, from whose island in the Bay of Biscay emanated various laws, which, about the year 1314, were adopted in this country—took full cognisance of the possibility of both wind and water mills being removed, and decided that this was illegal unless performed by the lord of the soil to which they were fixtures:—

Monumenta Juridica, II. 386.

Molin daique [d'aquæ] ne sunt nie moeble car il sunt forment affiche en terre et ne poent estre remuez en ter sanz domage de leur premere matere.

Or, eussi vers qui de molin de vent qui li ancun sunt tuit sor terre ob haute eschale, li ancun sunt lo pie fiche en terre, dit hom ben afficheement, et accordeement que ne sunt pas moble, car desenterre ne poent pas estre ne remue sanz domage de lor premere matere. De ceans molins qui sunt sur terre, volent ancuns dire que sunt moebles, quar hom les puet remuer sanz emperer lor premere matere, et contre ceu avom raison contraire. Quar ceu nest pas taus machinemenz cum est cube, toneas, ou arches ou nez encore truylz, que hom puet remuer: ainz est comme maison ob eschale, portant fest, et avent foc et loc et celables agent et fermant ob clef, et estable en son domaine sol et en son propre loc, et par ceste raison nest nie moebles.

Et ce fut iadis, au temps Sire Pere Dors et de Sire Helies Ronas et de Sire Iohan Viau et de Don Viau son frere et de Don Bertome Saugeta et de mainz autres prodes homes acorde sor i. conteuz qui fut dans molins dans cucheans et a ce que len vait. Parlent de

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remuement, porreit hom par meisme raison dire que maison qui est toute sus estelous poet hom remuer et por ce est moeble. Mais ceu est apertement faus, quar nule mayson est moebles et domques molins nest nie moubles car cest maison si cum nos auom dit.

1. Laws of Oleron.

Watermills are not moveables, for they are firmly fixed into the ground and cannot be removed entire without damage to their original materials.

And likewise with regard to windmills, some of which are altogether held above the ground, and have a high ladder, and some have their foot fixed in the ground, being, as men say, well affixed; and, accordingly, they are not moveable, for they cannot be detached from the ground, nor removed without damage to their original structure. Of those mills which are actually upon the ground, some people say they are moveable because a man may move them without destroying their original materials; but there is reason to the contrary. For they are not such machines as tubs, casks, or chests, and still less are they like wine-presses, which a man can remove. A windmill is like a house with a ladder, having windows and a fireplace, a cupboard and rooms, and closing with a key, and established on its own ground and in its own place. And for that reason it is not moveable.

This was adjudged some time ago, in the time of Sir Peter Dors, Sir Helies Ronas, Sir John Viau, Don Viau his brother, Don Bertome Saugeta, and many other good men, in a contest regarding some mills and haystacks, and to whom they belonged. Speaking of removing, a man might say that a house which is entirely upon posts might be removed, and for that reason is a moveable. But this is obviously false, for no house is a moveable; hence a mill is not a moveable, for it is a house, as we have said.

2. Meaux Abbey Mill.

2. The chartulary of Meaux records the bodily transfer of a windmill from one site to another, between 1372 and 1396, owing to a matter of toll:—

Chronica Monast. de Melsa: III. 172.

Etiam cum per longum tempus antequam ecclesiam de Skypse in usus proprius obtineremus unum molendinum ventricium in Beforth nobis collatum fuisset, et rectores ecclesiæ de Beforth proventus decimarum ipsius molendini de jure possiderent, idem abbas Willielmus, pro eo quod idem molendinorum in Beforth prope parochium de Skypse extitit situatum dictum molendinum de loco suo deponi fecit et in territorium de Drynghow infra parochium de Skypse in loco eminentiori iterum elevatum transferebat: de quo molendino ad ecclesiam de Skypse proventus decimæ ad iv vel v solidos exerevit annuatim.

Long before we obtained for our use the Church of Skipsea a windmill in Beforth was allotted to us, and the rectors of the Church of Beforth possessed the income from the tithe of the said mill. But as the milling district closely adjoined to the parish of Skipsea, Abbot William caused the mill to be removed from its place, and transferred to the territory of Drynghow, in the parish of Skipsea, in

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a more eminent and elevated place: so that now it yields the tithe, valued at four or five shillings per annum, to Skipsea Church.

2. Meaux Abbey Mill.

This summary method of extinguishing the claim of the rectors of Berford to tithe was all very well so long as the Abbot was both lord of the manor and owner of the mill, otherwise the operation of the Oleron law would have prevented its removal without the consent of all parties concerned.

Apart from legal complications the practical feasibility of removing a peg windmill has been frequently demonstrated.

3. Modern Removals.

3. The Ayloffe "Calendars" contain, under date 14 and 17 Charles I., "an order concerning the removing of a windmill that formerly stood on Monthill, Middlesex: to be brought back again."

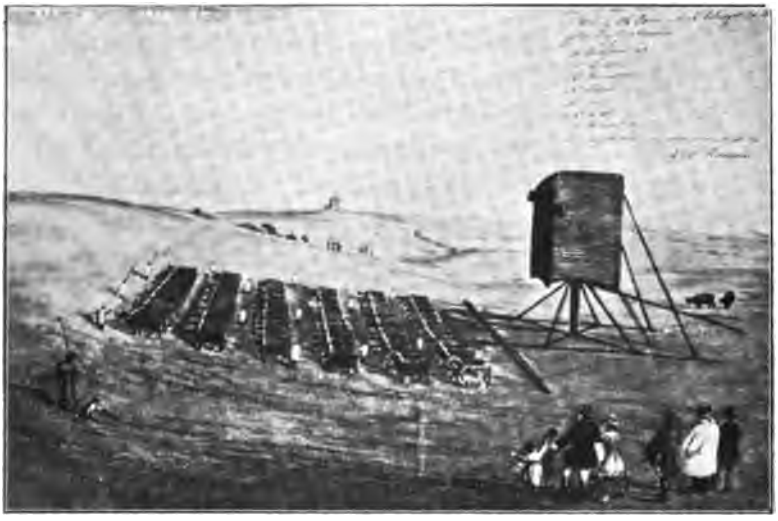
Ayloffe: I. 246.

Annual Register, Sept., 1768.

In 1768 we read:—"There is a windmill near Sir C. Peer's seat at Bromley, in Kent, which being in a disagreeable situation, Sir Charles is now removing the whole building together by means of capsterns: it is to be removed 400 yards, and proceeds at the rate of four yards a day."

On March 28, 1797, a timber windmill, which had long stood on the site of Regency Square, Brighton, was removed a distance of two miles to the top of the old Shaw Road, Preston, where, for many years, it remained a busy and familiar landmark. An old painting—with a photograph from which we are favoured by Mr. C. Potter, of the Lancashire and Cheshire Historic Society—depicts the curious spectacle of its removal, and is inscribed upon one corner of the canvas:—"This mill was drawn from a spot now called Regency Square, to Preston, a distance of two miles, on March 28, 1797, by eighty-six oxen, belonging to the following gentlemen—W. Stanford, Esq., Messrs. Hodson, Hamshar, Scrase, Trill, Hall, Hardwick: and the expedition was commanded by Mr. T. Hodson." The mill, of which the last tenant is

believed to have been Mrs. Cuttress, was finally de-



Removal of Brighton Mill.—*From an old painting.*

molished, but its foundations still remain in evidence on the Shaw Road hill.

At about 1790 the windmill at Hale, near Liverpool, was removed from Hall Bank, a site where, owing to the growth of a plantation of tall trees, it was deprived of the wind, to a more advantageous situation at Hognet, a quarter of a mile distant; the removal being effected by a team of thirty-eight horses; and remained on its new site for some years, till it was removed once more and finally by fire. Mr. W. Turton of Hale, grandson of the tenant of the mill at the time, to whom we are indebted for the information, remembers a rhyme which locally commemorated the transit of the mill:—

"They've moved the wooden mill
To the brow of Sandy Hill
According to contraction.

If the miller we can trust
Now we'll have a crust
To our satisfaction."

A later instance occurs in the year 1820, when a

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3. Modern Removals

decision in the Court of Common Pleas (Steward *v.* Lombe) definitely recognises under certain circumstances a post windmill (though not its foundations) to be a moveable. In this case, a plot of land, upon which stood a windmill, was mortgaged. The mill, which was stated to be "removable at pleasure," was "constructed in the usual manner, being an octagonal wooden edifice raised on a casement of brick-work, and anchored into the ground by spores and land ties, one foot under the surface of the earth." The whole of the mill, except the brickwork, spores, and land ties, was taken in execution by the Sheriff of Norfolk under a *fieri facias* issued against W. Burgess, tenant of the mill. The question raised at the action brought to recover the mill was whether the latter was affixed to the freehold or was a mere chattel; and the jury found that it was not a fixture—a view of the matter which was affirmed on appeal.*

Law Rpts. 1 B. & B. 506.

See also Ward's case, 4 Leon. 241. Gray *v.* Ulysses, Latch. 123.

The timber post mill lately standing at Fishbourne, Chichester, was originally erected at Little Hampton, near Sussex, and was removed bodily on a

* While it is in connection with post mills that removals have occurred in this country, America furnishes in the present year an instance of a three-storey timber tower mill—much resembling the mills at East Hampton illustrated on a later page—being bodily conveyed by water carriage from one site to another. "The windmill at Orient, Long Island, had perhaps better be called the windmill that was at Orient, Long Island, because it is there no more. An enterprising excursion manager having noted one day how people would drop their work and their play just for the sake of seeing the great sails flap lazily round, came to the happy conclusion to buy a windmill and put it in his park. Unfortunately for Orient, he found one at that place that could be bought, and so the picturesque mill, whose enormous wings have beaten the bracing Long Island air for four generations, has been transferred bodily to Glen Island, where it will be the admiration of the hundreds of thousands who go there every year. Portraying as it does the scenes of the past, when steam power was unknown, and when the modern roller mill with its wonderful system of machinery was not even dreamed of, the windmill is an object lesson in the material development and progress of the country that will not be lost, it is hoped, on those who see it. Local tradition says that Orient's (now Glen Island's) windmill was erected in 1760, by Amos Tabor, for Noah Tuthill, and restored in 1810. It was lately owned by the Terry Brothers, by whom the transfer to John H. Starin was made only a few weeks ago. A large force of men and a tug appeared at Orient, and after working for three days in dislodging it from its substantial foundation, they loaded up the familiar landmark on a barge, and transferred it bodily to its new site at Glen Island." The preservation of an old windmill solely because of its picturesque aspect in a landscape is not uncommon in England, one of the best known instances being the retention of the disused mill on Wimbledon Common, which we illustrate later.

Millers' Review, Philadelphia, July, 1898

trolly by road to its present site, over a distance of fifteen miles, about forty-five years ago. The photograph represents it as it appeared in 1896. It had not then been worked for five years, and in the summer of the present year Mr. C. H. Farne of Fishbourne Mills, the owner, felt compelled to pull it down owing to its being no longer safe.

Fishbourne Mill after removal.—*Photo. by C. Grant, Portsmouth.*

CHAPTER XVII.

THE SUNK POST MILL.

XVII. THE SUNK POST MILL.

1. Birkdale.

1. THE extreme liability of structures such as the primitive edifices already described to be capsized in storms, or even by sudden changes in the direction of an ordinary working-wind, seems to have early been obviated to some extent by sinking the timber foundation within the ground; thus originating the mills with "their foot fixed in the ground" which the laws of Oleron, of 1314, distinctly specify as differing from mills "held above the ground, and

Birkdale, Southport.—*Sketch by W. G. Herdman.*

having a high ladder." The appearance of mills built upon this plan may be illustrated by a sketch by Herdman, in the possession of Mr. Bennett, representing the ancient mill at Birkdale, Southport, Lancashire, about half a century ago, the floor of the structure being but slightly raised above the ground level.

1. Birkdale.

2. At Aughton mill, near Liverpool, recently was discovered almost intact the curiously-shaped excavations in which the sunken foundation timbers of the ancient post mill there had been fixed. This mill is mentioned as early as 1418 in connection with a demise of lands by Isabella, widow of Roger Bradeshagh, to her son Richard ("Annals of Aughton," Newstead, 1893). Some years ago the mill was replaced by a low tower, the sails in which, however, revolving so close to the ground as to kill sheep grazing beneath, another storey and a balcony were added, this being the present condition of the mill. In excavating a passage under the mill to the drying kiln recently, an ancient cutting in the solid rock was discovered, some feet beneath the surface; and at the instance of Dr. Peck, a local antiquary, a thorough examination of the site was made. The complete excavation was found to comprise four channels radiating from a centre somewhat in the form of a Maltese cross, its diameter being rather longer than that of the ancient mill which had stood over it. In the deep circular hole in the centre, as well as in the radiating cuttings, were found, imbedded in the clay with which they were filled, the decayed remains of stout oaken timbers, which—though the fact did not strike the discoverers—doubtless had comprised the trestle-work foundation of the original mill.

2. Aughton.

CHAPTER XVIII.

THE TURRET POST MILL.

XVIII. THE TURRET POST MILL.

1. Formby Type.

1. None of our more ancient representations of post mills depict them raised upon turret-like tower

Formby, Lancashire.

XVIII. THE TURRET POST MILL.

1. Formby Type.

stories of brick or stone; though for several centuries this mode of erection has been exceedingly common, and evidently was an improvement upon the original plan of leaving the space occupied by the tripod foundations unenclosed and unutilised. A characteristic specimen of the turret mill was that at Formby, Lancashire, which was blown down in a furious gale in 1883, Mr. John Robinson, the miller, who was within at the time, narrowly escaping with his life. The photograph of the exterior, for which we are indebted to the kindness of Mr. W. H. Robinson, son of Mr. John Robinson, just mentioned, shows the fixed conical turret of brick, above which the mill itself was turned upon its central peg by the beam; the latter also will be noticed to be supported upon a small wheel which rested upon a circular paved way of stone surrounding the mill, something like the walking track round the ancient Carthusian mill, London; the operation of turning

Interior of Formby Mill.—*Sketched by Miss A. L. Formby.*

the mill being now more easily accomplished than before, either by man or beast. The interior of the

XVIII. THE TURRET POST MILL.

1. Formby Type.

turret or lower storey is excellently illustrated by a sketch by Miss A. L. Formby of Formby, obligingly lent to us by the Rev. W. Warburton, vicar of the neighbouring village of Altcar. The stout post round which the mill revolved is seen to stand in the centre of the floor, fixed in its transverse foundation beams embedded in the ground.

The great benefit of a ground storey was the increased or rather improved accommodation it afforded for receiving and despatching grain and flour, a convenience which gave to this form of mill considerable popularity, and its adoption has been universal. Another ancient example of the type is found in the

Irby, Cheshire.

ruin at Irby, Cheshire; and a third, in a good state

XVIII. THE TURRET POST MILL.

of preservation, in a disused structure in Sherwood Forest, Notts. Like other windmills, many of them throughout the country are fast falling to decay;

1. Formby Type.

Sherwood Forest.—*Photo. by Mr. H. L. P. Lowe, Chepstone.*

as the mill of Burton Wood (photographed May 1890), the excellence of the stonework testifying to the long duration which, not so very long ago, the mill was contemplated to enjoy. One of the same type still at work is that at Freckleton, Lancashire; the wheel of the beam and its circular track round the mill being well defined.

2. In the more recent type of turret post mill a considerable improvement was effected by freeing the

2. Wavertree Type.

XVIII.
THE TURRET POST MILL.

2. Wavertree Type.

Burton Wood, Cheshire.

Freckleton, Lancashire. *Photo. by G. Dewey, Ashton, Preston.*

XVIII. THE TURRET POST MILL.

2. Wavertree Type.

turret from the encumbrance of the post and foundation beams. Instead of the beams resting on the ground or upon the old low brick pedestals (as at Bozeat), these latter were built up into buttresses six or seven feet high, and the beams were held up at that height on them and supported the post above. The latter, for the first time, is thus found held entirely out of the ground, and small as the detail seems, it really constitutes, in the construction of the mill, that new departure which resulted in the possibility of erecting tower mills. In this aspect the turret post mill, insignificant as it may perhaps now be regarded, assumes a new importance and interest. At Wavertree mill, Liverpool, an ancient post mill rebuilt in the last century, the buttresses supporting the

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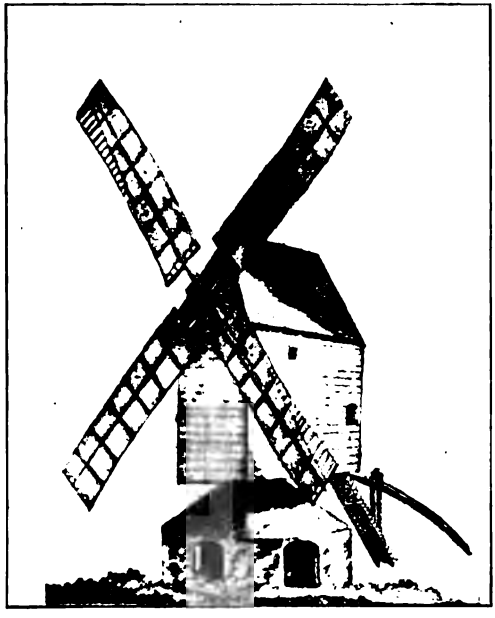


Diagram : Wavertree Type.

timbers are at a height level with the tops of the doorways (of which there are four); and the interior appears as a clear, open circular room. Thus in this mill are combined the elementary features of the

XVIII. THE TURRET POST MILL.

2. Wavertree Type.

most ancient and the most modern windmills; the buttresses being developments of the low foundation blocks of the primitive post mill, and the turret being the embryo of the tall, capacious tower of the future.

The latest form of the turret mill is illustrated by that of Rustington, a mill still busily at work, and comprising the late winding gear about to be described.

Rustington, Sussex.—*Photo. by R. H. Gault, Kew.*

3. Automatic Gear.

3. As the turret mill yielded one suggestion for the construction of the tower mill, so it seems later to have adopted from the latter one of the systems by which the tower mill was manœuvred. The cap of the latter only, and not the entire mill, being turned to the wind by automatic gear, this latter was applied to the turret mill. As described with regard to towers,

the gear comprised a small sail wheel, fixed on the cap at right angles to the main sails of the mill, so that when the wind changed, and ceased to revolve the main sails, the small set of sails were revolved, and, their motion being communicated to the cap, caused it to turn till the fly sails ceased moving, when, of course, the larger sails again revolved. At the turret mill this fly gear was attached above the wheel at the end of the beam, or at the end of the ladder: its motion causing the wheel to turn and carry round the beam (and so the mill and sails) to the desired

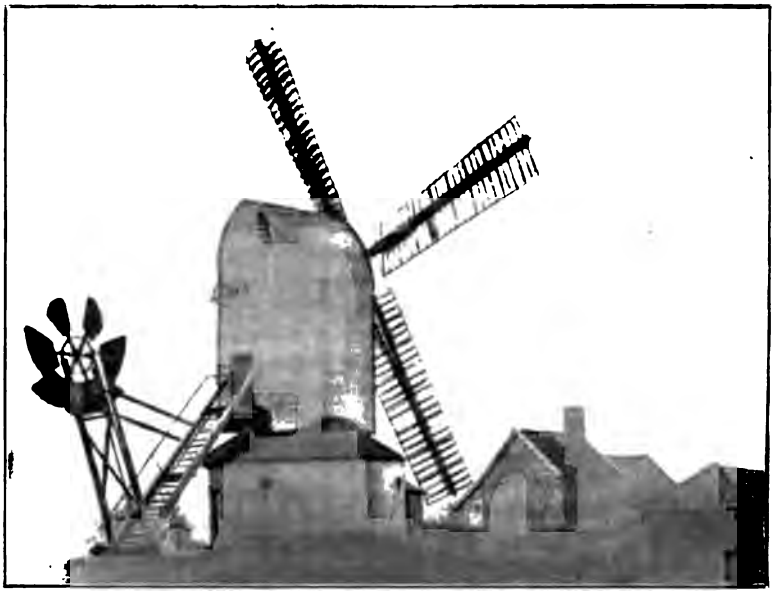
Bungay, Suffolk.—*Photo. by B. Clarke, Bungay.*

quarter. Many rural turret post mills thus equipped, and well built, are still to be seen throughout the

XVIII. THE TURRET POST MILL.

3. Automatic Gear.

country, that of Bungay being an excellent example. A contrast is afforded by Metfield mill, Norfolk, one of the same late type, painfully associated with a sad episode indicative of the hard press of modern life in some parts of the milling world. The attempt to make this mill pay its way was last year found by its owner, after many years' labour, to be for him but a hopeless struggle; and leaving on the mantel-shelf of the house a request that his pony might be shot,



Metfield, Norfolk.

he—"a broken-down man, driven into his last corner" —ended his life's failures by a rifle-shot. The mill, which is situated near Harleston, Norfolk, was shortly after sold by auction, being described as a self-winding post mill on a brick roundhouse, with four patent sails, and driving two pair of stones; the whole, together with the site of the millhouse, bringing no more than the sum of £100.

CHAPTER XIX.

POST MILLS IN THE WARS.

XIX. POST MILLS IN THE WARS.

1. Cressy.

1. THE old post mill, in time of war, ordinarily obtained a distinct strategical value for either purposes of defence or offence; and while in common with watermills, many of them standing on the verge of towns or in open country, near the site of battlefields, have been destroyed, as was that at Eastham, during the siege of Liverpool, in 1644, many others have merely been utilised temporarily during the progress of battles in their vicinity, and left intact to recall in more peaceful times the horrible carnage of which they have once been witnesses.

One of the earliest instances in point, merely traditional, however, is that of the windmill at Cressy, from the window of which Edward III. is said to have watched the progress of the battle there, August 26, 1346. The structure was a turret post mill crowning the hill commanding the field of Cressy, and was stated, at the time of its demolition in 1887, to have had turret walls seven feet thick, being known by the country folk as Moulin de Pierre: the stone mill. The *American Miller* (Chicago) recently published a view of the interior, showing the grinding floor supporting one pair of millstones of large diameter driven by an upright shaft of massive and primitive construction.

2. Edge Hill.

2. Coming to later times, post mills several times appear on battlefields during the Civil Wars. On the wind-swept summit of Edge Hill, Warwickshire, still

XIX. POST MILLS IN THE WARS.

stands the weird-looking ruin of the post mill, whence Charles I., on October 23, 1642, witnessed his first battle, and met with his first repulse. "The pen and pencil may labour hard to obtain the eerie effect of its gaunt form standing black and solemn against the darkening sky: the sail arms battered, twisted, and riven in every direction: and long ranges of deserted barns in the background growing vague and indistinct: yet the touch of awesomeness which creeps upon you as you gaze is not to be reproduced on paper or canvas."

2. Edge Hill.

Rambler Mag., July 1897.

See Title page.

3. Latham.

3. At the famous siege of Latham House, near Liverpool, the seat of the Earl of Derby, the Ironsides who invested the place, immediately on their arrival in February 1644, seized the windmill, "and being soe tented the souldiers here lye under it without danger, and alsoe goe round aboute it upon wary lookinge to themselves:" though they were finally obliged to look to themselves in another direction, and abandon a siege gallantly withstood by a brave countess and doughty garrison.

Discourse on the Lancashire Warre.

4. Naseby.

4. On June 14, 1645, Charles I., who from a windmill had witnessed his first repulse, again stood in a windmill and saw, at Naseby, his last irrevocable defeat. Sir John Southcote (in a letter now in the MS. Library of the Dominican Friars, Woodchester, Stroud) writing of the battle, says, "the writer of this letter afterwards visited the ground, and was shown the windmill in which the king sat to see the battle, and the hawthorn bush where Oliver posted himself for a like purpose; after this battle the king appeared no more in the field."

MSS. Com. Report, App. 148.

5. Evelith.

5. Charles II. had reason to remember Evelith mill, and more than one miller. The night after his escape from the defeat of Worcester, September 4, 1651, while making his stealthy way to Madeley, in company with Richard Penderell, the fugitives had to pass Evelith mill. The king himself recounted what

transpired to Pepys, whose MS. account is preserved in the Pepysian Library, Cambridge. "Richard Penderell and I took our journey on foot towards the Severn. But as we were going we came by a mill where I heard some people talking, and as we conceived it was about twelve or one o'clock at night: and the country fellow (Penderell) desired me not to answer if anybody should ask me any questions, because I had not the accent of the country. Just as we came to the mill we could see the miller, as I believed, sitting at the mill door, he being in white cloaths, it being a very dark night. He called out 'Who goes there?' Upon which Richard Penderell answered, 'Neighbours going home,' or some such like words. Whereupon the miller cried out, 'If you be neighbours, stand, or I will knock you down!' Upon which we, believing there was company in the place, Penderell bade me follow him close, and he ran to a gate that went up a dirty lane up a hill, and opening the gate, the miller cried out, 'Rogues! rogues!' And thereupon some men came out of the mill after us which I believed was soldiers: so we fell a running both of us up the lane as long as we could run, it being very deep and very dirty, till at last I bade him leap over a hedge and lie still to hear if anybody followed us: which we did, and continued lying down upon the ground about half-an-hour, when hearing nobody come, we continued our way to the village upon Severn." The awkward adventure which, twenty-nine years after it occurred, Charles so vividly remembered was, after all, a false alarm, as Roger Bushell, the worthy miller, was a staunch Royalist and little knew whom he was chasing when, as Charles was fond of declaring, the rustling of Richard's stiff calf-skin breeches was the only guide he had as he fled after Penderell along the dark lane.

5. Evelith.

An Account of the Preservation of Charles II., Drawn up by Himself, 1766, 15.

6. Within a few days the fugitive king returned from Madeley to Boscobel in Shropshire, where a

6. White-ladies

XIX. POST MILLS IN THE WARS.

6. Whiteladies.

polled oak afforded him shelter; and on leaving that hospitable house he was mounted upon the horse that ordinarily carried corn and flour to and from the mill of Humphrey Penderell of Whiteladies, near Boscobel. As the miller set out with Charles on his secret journey, the weary king grumbled that his mount was the dullest jade he ever rode on; whereupon Humphrey, "answering beyond the usual notion of a miller," wittily replied, "My liege, can you blame a horse to goe so heavily when he has the weight of three kingdoms on his back?" The old mill horse, as all the world knows, carried it, so far as Charles was concerned, with both perfect safety and competent speed. The Penderells and their descendants, like the Miller of Mansfield, who entertained Henry VIII.,* did not go unrewarded, and as late as 1815, it is proudly recorded of Mr. Thomas Penderell Rock, who died December 4 in that year, at Graisley, near Wolverhampton:—"He was a descendant of the honest high-minded miller justly celebrated in the story of the flight of Charles II. from Worcester, who stood at the door of his mill and heard £1000 offered for the king whom he had safely concealed." The site of Humphrey Penderell's mill at Whiteladies was distinguishable, a few years ago, by a large hole in which had stood the post in the corner of the meadow. The millstone had lain close by time out of mind, but was eventually removed to the yard of Whiteladies farm, half a mile distant, where it is still to be seen.

The Book of Boscobel, 1660.

Flight of the king: A. Fea, 1897, 19.

* The tradition is that John Cockle, a miller and forester in Sherwood Forest, hearing the report of a gun in the woods at night, went out to capture poachers, but came upon the king, who said he was a wayfarer who had lost his friends: Cockle thereupon taking him to the mill and lodging him for the night. Next day he ascertained, from a party of courtiers who had been arrested as poachers, the identity of his guest, and was rewarded by the thanks of the king, a knighthood, and a pension of a thousand marks a year.

CHAPTER XX.

THE TOWER MILL.

1. THE post mill had been provided with most, if not quite all, of its successive improvements, when, in the sixteenth century, the entire machine was surpassed by the introduction of the tower mill. Essentially this latter was a mere development of the turret post mill: the turret being raised higher, and the grinding machinery of the mill being transferred to it from the wooden structure above, which thus contained nothing

1. A Development of the Turret.

German Post and Tower mills: Seventeenth Century.

but the sail beam and its gear. There can be no doubt that it was by long contemplation of the disadvantage of turning so heavy a burthen as the post mill with all its grinding machinery and stock of grain

XX. THE TOWER MILL.

1. A Development of the Turret.

or flour, that the idea arose of thus devoting the revolving upper wooden structure solely to the sailbeam, and so making the labour of turning it to the wind a comparatively easy matter. The honour of effecting this slight but extremely important development of the mill is attributed to the Dutch: Leegwater (1575–1650), a Flemish writer of considerable talent as a mechanician, definitely stating that the moveable top for turning a mill round to every wind was first found out in the middle of the sixteenth century by a Fleming. The primitive tower mill of brick or stone,

Kovphan. van Amsterd., 1727: II. 384.

Detroit, Michigan, U.S.A.

surrounded by its small wooden gable or "cap," appears therefore but a very slight modification of the turret post mill.

2. Beam Winder.

2. The beam which turned the post mill was first affixed to the cap on the summit of the fixed tower; which cap alone it turned to keep the sails filled by the wind. A mill of the kind is found in a very ruinous old timber structure at Detroit, which stands on the first white settlement in the north-west of the United States founded by French Canadians in 1683. A pleasing aspect of the same type of structure occurs at East Hampton, Long

Pict. Amer. 1872, I. 545.

Ibid., I. 256.

East Hampton, Long Island, U.S.A.

XX. THE TOWER MILL.

2. Beam Winder.

Island, where are two octagonal grist mills of considerable antiquity. At East Hampton, and near these mills, is the small cottage sacred the world over as the early home of John Howard Payne, who, in his subsequent homeless wanderings, penned from his remembrance of this place the heart-stirring tender little lyric, "Home, Sweet Home." The interior arrangement of a more modern mill of the kind is shown in the annexed diagram, for the use of which

Spon's Dict. of Engineering, 1873.

Modern Tower: Cap and Beam.

we are indebted to Messrs. E. & F. N. Spon, London. With no heavier burthen to turn than the comparatively light cap, there was little limit to the size to which the fixed towers might be erected, and, by the addition of a balcony surrounding the tower at a convenient height, the beam was as easily propelled from that high level as formerly it was from

XX. THE TOWER MILL.

2. Beam Winder.

the ground. Among the innumerable instances of this type of mill to be witnessed in almost every civilised part of the globe, we have selected as

Reikjavit, Iceland.—*Photo. by Mr. P. Lange.*

illustrations those of Reikjavit, Iceland, and Tholen, Holland, both of which are excellent modern examples of the type in actual working order.

3. Pulley Winder.

3. The use of this cumbrous beam was at best a difficult and laboursome task, even upon many towers of not sufficient height to be provided with balconies; while disasters have frequently occurred upon those so provided. At Harbury, Warwickshire, a mill of this type and in bad condition, it is related

XX.
THE TOWER MILL.

3. Pulley Winder.

Tholen, Holland.

that one of the millers, going upon the balcony during the night to trim the sails round on a change of wind, was caught in the darkness by a projecting pin that had been used in a rough way for making a repair; being caught by a sailyard, and literally beaten to death; while the other miller, on going out to ascertain the cause of his delay, sustained serious injury by falling through or over the balcony upon the roof of an adjoining cottage.

Of a ruined mill of this type preserved near Commodore Perry's statue at Newport, U.S.A., it was stated, in a deposition of one of the old inhabitants of the town in 1734, that "when the change

XX. THE TOWER MILL.

3. Pulley Winder.

of wind required that the wings with the top should be turned round, it took a yoke of oxen to do it." This mill is somewhat of a curiosity in the style of its erection. Longfellow, adopting a popular tradi-

Newport, Rhode Island, U.S.A.

tion, attributes its establishment to the prehistoric Danish period, when the Viking old found his way thither from the wild Baltic's strand, and built, as a fort, this "lofty tower" by the sea :—

> "There for my lady's bower
> Built I a lofty tower,
> Which, to this very hour,
> Stands looking seaward."

Cullen Bryant, observing, "We wish we could believe

XX. THE TOWER MILL.

3. Pulley Winder.

in our having so respectable a piece of antiquity in Rhode Island," states that the first authentic mention of the mill occurs in 1677 in the will of Benedict Arnold, bequeathing his "stone-built windmill" to his heirs. "It is regarded as somewhat singular that such a substantial and peculiar structure should have been erected simply as a windmill, but it is explained by the fact that the first wooden mill was blown down in 1675, and that Governor Arnold, who was unpopular with the Indians, would be likely to rebuild the mill so that it would withstand not only storm but fire, and would at least look like a fort: and still further he may have seen old mills in England of the same style—there being an engraving in the *Penny Magazine* of 1836 of one near Leamington which is the very counterpart of the Newport mill. However, the various traditions connected with this old relic impart to it a special interest, and, unless it is upheaved by earthquake or demolished by lightning, it is likely to stand for many generations." The structure seems to be a most unlikely one for a fort, and probably it was a desire for quaintness in the style of his new mill that prompted Arnold to build it upon a series of arches; though there are many mills of the kind with four doorways, as that of Wavertree, Liverpool. The mill at Chesterton, near Leamington, which possibly may have been adopted as a model by Arnold, is supposed to have been designed by Inigo Jones. If so, we are inclined to think that the talents of the distinguished architect were strangely misapplied in an attempt to impart an air of æsthetic beauty or Gothic majesty to the plain, but still picturesque tower of the ordinary windmill. In any case the experiment does not seem to have been repeated. But, to revert from this digression to the beam of the Newport mill, it is evident that its manipulation was an exceedingly

Pict. Amer., I. 375.

XX. THE TOWER MILL.

3. Pulley Winder.

difficult and troublesome duty for the miller; and thus as towers generally were heightened and sail-

Chesterton, near Leamington.

yards lengthened, the working of the cap would become increasingly onerous.

An improvement of a very simple nature obviated however all difficulty in rotating the heaviest cap; the beam being abolished and the cap being fitted with a pulley wheel working in toothed gearing fixed round the top of the tower. An endless rope, hanging round the pulley and descending on the exterior of the tower either to the ground or to the balcony, on being pulled by the miller caused the pulley to

XX. THE TOWER MILL.

3. Pulley Winder.

travel on its grooved track and carry the cap with it round the tower, thus adjusting the sails to their required position. Still this arrangement, like the beam, necessitated constant watchfulness on the part of the miller, who had to keep alert to every change of wind and trim his sails accordingly. In mode-

Ilford, Essex.

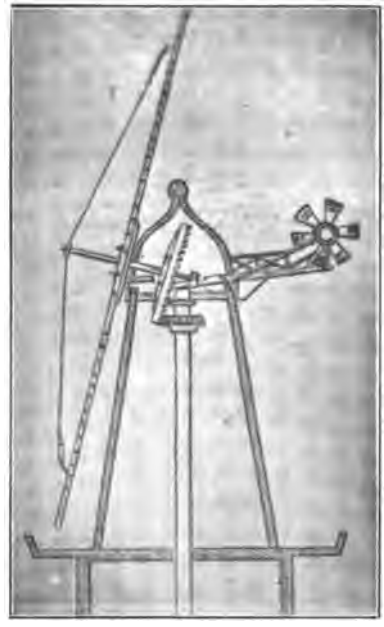
rately calm winds the matter was simple and easy, no doubt, and involved little or no danger; but in strong variable winds a sudden change that was not immediately met by the miller bringing round the sails, frequently meant the destruction of the entire upper gear; the sails standing athwart the wind being

swept off, and carrying the cap away with them. Such a disaster at Napton (reputed one of the most powerful mills in Warwickshire), due to the millers letting the wind get at the back of it, is stated to have cost the owner about £200. A delay of but a few minutes in trimming the mill on a sudden change thus entailed very serious consequences to the miller, while if such disaster were averted it was only by the exercise of a constant watchfulness that necessarily detracted from the effective labour executed within the mill.

3. Pulley Winder.

74. Under such circumstances the introduction of an automatically winding cap must have been cordially welcomed by the craft, though it failed to altogether oust from all mills the pulley and rope, or even the more primitive beam. One simple mode of making

4. Automatic Winder.



Spon's Dict. of Engineering: 1873.

Automatic Cap Tower.

XX. THE TOWER MILL.

4. Automatic Winder.

the change self-acting was to fit the back of the cap with a large vane, in form something like a fan, which, acting in the same way as a weather-cock, would always keep the sails up to the wind. But when mills were of considerable size, such a vane would necessarily be very large and cumbrous; and to meet such cases there was introduced a neat and ingenious contrivance which, proving perfectly successful, is now found upon the towers of all the best equipped windmills. Behind the cap is mounted a small set of sails on an axis at right angles to the main arms of the mill; the cap itself resting on toothed gearing on the top of the tower as before, and the motion

Rye, Sussex.

4. Automatic Winder.

of the small sail wheel being communicated to this gearing by a pinion. When the main mill has its face presented to the wind and is revolving, the small one stands edgeways to it and is at rest; but on the current changing, the small sails are affected, and keep the sails adjusted to the required position. As already described, this principle has been adopted to replace the beam arrangement for turning the body of post mills.

Among early instances of the use of the automatic gear is that of its adoption at the old timber tower at

Horsey Mere.—*Photo. by P. Jennings, Ashtead.*

Rye, Sussex; the sketch of the mill being interest-

XX. THE TOWER MILL.

4. Automatic Winder.

ing also as illustrative of the troublesome and dangerous manner in which the sails were furled or repaired by men who clambered up the yards. The tower at Horsey Mere is a later brick edifice fitted with the same apparatus; while Ludham Mill with its symmetrical tower surmounted by the automatic cap, affords an elegant example of the latest type of modern windmills.

Ludham.—*Photo. by P. Jennings, Ashtena.*

With a contrivance of this character there was little practical limit to the height to which towers might be carried; and it was this device therefore that rendered possible the great development which recent times have witnessed in the construction of large windmills. An excellent example of a mill of this

XX. THE TOWER MILL.

4. Automatic Winder.

character is found in that of Messrs. Press Brothers, Southdown, Yarmouth, one of the most complete tower mills ever built, and rising 120 feet above the ground level, the tallest in England. The structure,

Southdown, Yarmouth, 120 feet high.

surmounted by its domed cap with railed lantern and automatic winding gear, seems as though it bade defiance to the strongest tempest, and welcomed for profitable use winds from every quarter of the heavens.

5. Mechanism.

5. The mechanism of a windmill, of an exceedingly simple nature at best, remained very much the same five centuries after its invention as it originally was. None of the incidental improvements, which brought it to that degree of perfection it did attain, seem to have been introduced till a little over a century ago,

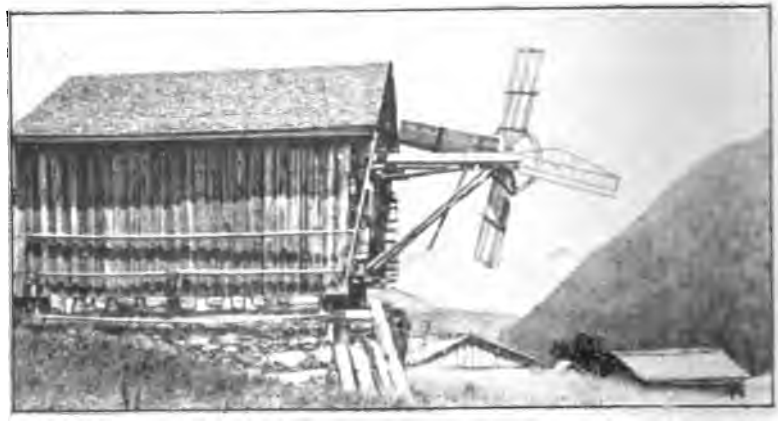
XX. THE TOWER MILL.

5. Mechanism.

the most important of them dating very much later still; the entire machine thus remaining a standing monument to the practically dormant condition of milling science for over five hundred years. Perhaps

European Quarter, Rhodes.

the most noticeable of ancient improvements was comprised in the six-sail mill; and this, though generally long since abandoned, remains in some places as primitive as ever. At Rhodes, within a very short



Vallorcine, Switzerland.

space is a cluster of a dozen of these contrivances; the type of which has in modern times been valuably improved upon in the construction of the various forms of American steel-built mills, used sometimes for grist grinding, but generally for irrigation purposes. Another curious improvement is that seen in some of the Swiss mills, in which the tower is entirely abolished; though such an arrangement, of course, is only suitable for small mills at high altitudes.

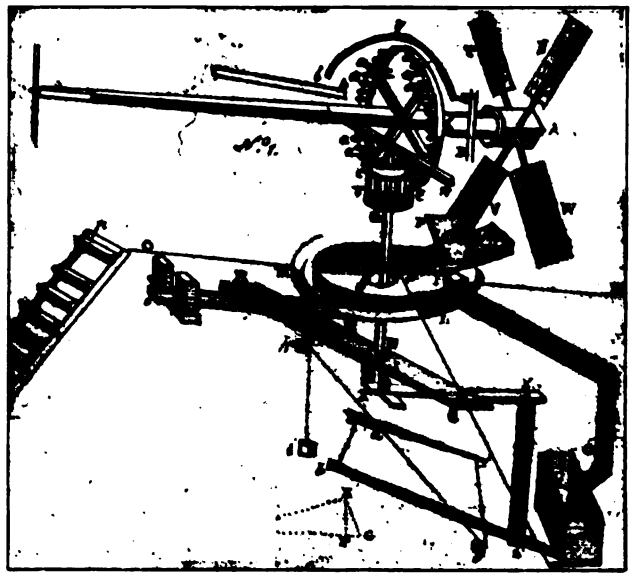
5. Mechanism.

In the last century engineers devoted much attention to the windmill, and made various changes in its system of mechanism: chief among them being Smeaton, Ferguson, Maclaurin, Coulomb, Parent, and others of note. It is beyond our province to consider the technical matters so ably studied by them, or yet to trench upon the field of modern practical exposition so ably filled by Kick, Grimshaw, and Voller. Still, since two or three peculiarities of machinery, special to the windmill towards the close of the last century, are rapidly becoming things of the past, these may briefly be described. In the diagram representing the working parts of a windmill of good standard type in the year 1755, the whole of which is readily intelligible, only two of the details are sufficiently curious to call for notice as specialities. The first relates to the contrivance for stopping the mill by destroying the momentum of the sailbeam. Upon the beam is a vertical toothed wheel driving a basket pinion on the descending shaft which communicates with the grinding stone. Above the toothed wheel is a curved band of pliable wood *lyx*, which is fastened at the end *x* to some fixed beam in the mill, and at the end *l* to a lever *km*; while a cord attached to the lever at the end *m* runs down to some convenient place within the mill. To stop the mill the cord was tightly pulled, the girth *lyx* being thus pressed on to the drum of the cog-wheel, and acting as a brake to arrest the motion of the sail-

XX. THE TOWER MILL.

5. Mechanism.

beam. Besides the ordinary use of this appliance for bringing the mill to a dead stop, it was invaluable for minimising the danger of fire during storms; when with the sails driven at great speed some such brake-power was necessary to prevent the mill becoming unmanageable (or "running away" as the millers termed it); and the great friction engendered igniting the beam and mill. Thus though the band of



Tower Windmill Mechanism, 1755.

pliable wood was in time abolished for the solid shoe-brake of modern times, the appliance has remained practically identical in its simplicity of parts and construction to the present day. Even with the break hard on, it was no simple matter to stop a mill that had once started to run away; and among the traditions of the old windmills of Liverpool none more vividly recall the occasional great dangers to which millers were exposed than the memory of one of the

craft whose death was directly caused by his efforts to apply the brake and stop his mill in a furious gale.* XX. THE TOWER MILL.

Another prominent and curious feature was the arrangement for setting the stones, which, though on a larger scale, was practically identical in its nature with the method adopted in the quern for grinding fine or coarse meal. Referring to the diagram, the spindle G N, revolved by the basket pinion F E, connected with the sail beam, is fixed to the upper stone by the iron rynd on the under side of the same: thus the entire weight of the running stone K I rests upon the pivot at the foot of the spindle: this latter resting in a socket of hard stone fixed in the bridgetree Q R at N. Thus by the raising or lowering of the bridgetree the upper stone is raised or depressed and grinds coarsely or finely as required. The quern-like arrangement is perceived in the bridgetree being fastened at one end (R), and being left loose at the other (Q), as in the modern Scotch quern: the action in the mill being produced by the pulling of a cord *i h* in another part of the building, the cord communicating through a series of levers, *z y* and *x y*, with the end *q* of the bridgetree which it raised or depressed. At some mills a screw action took the place of that of the levers. The automatically adjusting bridgetree is described by Brewster:— 5. Mechanism. Text: I. 174.

The bridgetree is a piece of wood nine feet long, one foot broad, and five inches thick, and rests upon props at its ends. . . . Under Nat. Phil., 1823: II. 317.

* The storm in question, disastrous both on land and sea, took place on Sunday night, January 6, 1839. The North Townsend mill, a tall brick erection, tenanted by a well-known local worthy of the craft, Jeremiah Shaw, stood on the shore of the Mersey, seaward. Ordinarily accounted one of the "best blown" of the cluster of windmills which girt the shore at this exposed point, it received the full volume of the storm, and proved unmanageable. Shaw, who early found that the mill could not be held in (writes his old friend, Mr. George Lunt) was on duty all night, and every sack of wheat had been shot on to prevent her taking fire; but it was all of little avail, and she tore away in spite of every effort to check her. There was a point in the mill to which a brake could be applied, and to this ultimately he applied a strong and long lever of wood by which for some time she was held in; but finding his strength failing, he contrived to balance himself on the end of the beam, and there sat; succeeding finally in keeping the mill somewhat in check till assistance arrived. But the straining and shaking, too much for a man of his years, proved fatal, for he died from the effects very shortly afterwards.

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5. Mechanism.

the weight of the millstone and the spindle, the bridgetree must necessarily bend downwards in the middle. The inventor expected it. In fact from it proceeds all that is ingenious and beautiful in the invention. The corn as it passes between the stones, and works its way in the form of meal and flour towards the edges, does so under the weight of the running stone, which at times it has a tendency to lift up. The bridge being already bowed down in the middle, strengthens as the stone lifts, and thus the weight of the latter, under all conditions, is kept steadily upon the corn and flour. The inventor of this ingenious contrivance is not known. It has been preserved by imitation through a long series of centuries, but without having been yet, perhaps, exactly minded. M. Belidor is the first who has informed the public of it.

With all the care and ingenuity expended in the improvement of windmills they were still not considered as perfect as might be even on the eve of the introduction of steam, which heralded their supersession and abandonment as premier mills of the world :—

Dict. Arts and Sciences, 1755 : IV. 3384.

There are three things yet wanting to the perfection of a windmill: (1) Some contrivance in the nature of a fly to regulate the motion of the train of mechanism under the irregular and unequal impulse of the wind; (2) Some other contrivance to supply the hopper or stones with more or less corn in proportion to the greater or less strength of the wind; (3) A method of altering the angle of the sails' obliquity from its maximum of 54° 44′ at the beginning of its motion to its minimum when in motion—

with which desiderata in view, just thirty years before the establishment of the first steam mill in London, this technical portion of our subject may close.

6. Decadence.

6. Time, which perfects all things, had thus no opportunity of perfecting the windmill ere the advent of steam converted the mighty wind-driven motor, the pride of its age, into quite a minor machine in the corn-milling world. As a picturesque object in the landscape, the windmill is still characteristic of rural England: its massy tower reared on prominent site, its sails exposed to "all the airts the wind can blaw," and busily revolving to them all: its cheerful aspect of life and motion on the quiet country side, impart animation and charm to many a pleasant spot in the shires: but otherwise the mill attracts little interest.

frequently being devoted merely to the grinding of stuffs for cattle food, and rarely indeed endeavouring to compete with the giant roller mills of our ports that enjoy every facility of transport and inter-com-

6. Decadence.

Raylish, Essex.—*Photo. by P. Jennings, Ashtead.*

munication. Very commonly such windmills are sold by auction at marvellously low prices: one recently, standing in a good corn-growing district in Suffolk, close to two well-populated towns, and comprising a six-floor tower mill, with patent sails and auxiliary steam-power, with residence and gardens free of land-tax and tithe, being sold for no more than £250. The interior of the structures, which well repay a visit by the curious in such matters, has been pleasantly sketched recently by a rambler through the shires:—

The interiors of these old mills are very dark, very puzzling, and extremely interesting; and it is always worth while, supposing you not to be already acquainted with the art and mystery of milling, to seek permission to inspect one. The miller, who is a contem- Rambler, July 1897.

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plative man generally, may often be seen on the little platform at the head of the stairs which leads into the first floor of his windy place of business, gazing, with mildly speculative glance, upon the country spread out like a map beneath him. He is surprised that any one should wish to see the details of a business which is to him, through long acquaintance, so commonplace; but, politely enough, he does the honours of his dusty workshop. You must not mind your clothes becoming whitened with the flour which has settled thickly over floor and rafters and ledges—in every conceivable and inconceivable nook and cranny in fact. As for the miller. his face, his beard, his clothes, are all grey with thin deposits of it, while the creases of his waistcoat and the rim of his hat hold drifts of the powdered grain. There are generally three floors to windmills. The top one is a veritable cave of the winds; it rocks and echoes much more than any other part of the building with the whirl of the great sails outside and the grinding of the machinery below. In the next storey the grain is tipped into the insatiable maws of revolving cog-wheels and rapidly circulating millstones, to come lower still, in the shape of flour, into great bins and other sacks. The miller, perhaps, opens the "bolter" for you, and. amid a cloud of fine flour-dust, you perceive the chief constituent of the future half-quartern loaf descending in a continuous stream. The smell encountered within a windmill is a peculiarly wholesome and appetising one, and everything recalls the leisured ways of old England, before the fever of modern times seized upon the land.

The output of tower mills, like that of post mills, depended very largely upon the size of the sail-yards, the necessity for giving as great a length as possible to these essential features of the mill being, of course, one of the reasons which prompted the erection of the huge towers of modern times. On an average a five-storey mill, such as that of Raylish, would have yards measuring about 80 feet from tip to tip. Necessarily, there was never attainable any great regularity, either in the quantity ground, or in the precise quality of the produce. It required nearly as much courage to handle a large windmill as to handle a ship; in a gale a nervous man would put on the brake and hold by, while a man with plenty of courage, and with confidence in his mill, would put on more feed and let her go. The old-fashioned millers, like some of the old sailors, had a great contempt for modern machinery and appliances: "God sent the

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wind, and when it comes it ought to be used," was their motto, and they rarely shrank from putting it to the best use. Under such conditions the rate of output was a very variable quantity; but, with an ordinary wind, a well-blown tower mill would readily yield, with one pair of stones running, two sacks of grist, of 240 lbs. each, per hour, and in a gale would double or treble that quantity. A five-storey gristing mill at Prescot, Lancashire, with sails 85 feet from tip to tip, will drive four pair of 4 ft. 6″ stones in a high wind, with an average output of 20 bushels of barley, &c., per hour from each pair; the highest rate of output reached having been 26 bushels in the hour. A mill at Woolton, with five pair of 4 ft. 6″ stones, the whole of which could be readily worked in a steady wind, yielded about the same average output. At Aughton, Lancashire, with sailyards 75 feet from tip to tip, a set of four pair of 4 ft. 6″ stones have been worked in a high wind. A set of French burrs here has been for many years almost exclusively used for grinding wheat flour for the manufacture of the famed gingerbread of the neighbouring hamlet of Ormskirk; and a test grinding with them gave, under favourable conditions of working, an output of 14 bushels of 60 lbs. each in an hour. Among the many reminiscences of Mr. J. Fletcher, for half a century tenant of this mill, respecting output, is one of his early days, during his father's tenancy, when sifting was done by hand; the miller in charge being accustomed, on finding the stones in a good wind grinding faster than his man could sift, to shut off the mill till he could get on even terms with her in the sifting; a method of working which at times produced an awkward condition of affairs for the master miller, anxious to get the best results of a day's work. At the same mill, on an old pair of French burrs, formerly used for wheat, but now devoted to grist, the greatest output has been 19

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bushels in an hour. A pair of shelling stones, 5 feet in diameter, have turned out 125 bushels in a day of ten hours.

But with respect to this topic we are met in all directions with that constant source of uncertainty and irregularity of working, the fluctuating power with which the wind miller had to deal. Often for days together not a breath of wind fanned the sails upon which the weary miller rested his waiting gaze: at other times light airs were insufficient to move a pair of stones; sacks of grain the while lumbering the mill floors, and hoppers overflowing with the same hanging over the silent burrs. At such times the miller had ample leisure to speculate upon what he could accomplish if he but had a more reliable power in the mill; and no doubt had equal leisure to practise that infinite patience, and indulge in that equable temperament for which his craft is yet proverbial. And when the long-wished breezes came—if indeed they were not the tempests which roused the man's nerves and emboldened him to fill in every feed and run every stone in the mill—they had to be made the most of while they lasted; even, on occasion, with a fair wind after a long calm springing up on a Saturday night or a Sunday morning, local Sabbatarian bye-laws, if nothing more, being, as though in desperation, broken, to relieve the overcrowded mill and supply the bakers with the flour so much in request. Before the days of steam it was no uncommon occurrence to see the great sails of tower mills conspicuously commence turning in the early dawn of Sunday morning and gravely continue at work the whole day through. Many a story is told of the quandaries of millers upon such risky occasions; and many a gentle admonition has accompanied the infliction of the nominal fines which often had to be paid by the craft—for a windmill turning on a Sunday was too open and flagrant a

Text: Vol. III.

delinquency to be hidden—as a consequence of such temerity.*

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Naturally many of the disused mills which have not been dismantled have fallen into decay, and numerous such examples of ruin as are presented by the desolate structures at Kirkham, Lancashire, and Long

Kirkham, Lancashire.

Buckley, scattered throughout the kingdom, remain to the present generation as instructive signposts of

* One of various traditions which Mr. G. Lunt has kindly recounted to us refers to such an occurrence. "One if not two of the tower windmills above the steps at the top of Clayton Street, Liverpool, was worked in the early twenties by Richard Rawsthorne, a member of an old local milling family. My father had not then commenced milling, and kept a bread and flour shop in Gerard Street close by. It was summer time, and there had been neither rain nor wind for weeks. The country watermills at Kirkby, Aintree, and Sefton had long been dry. My father (I have often heard him tell the memorable anecdote) had wheat at White's windmill, Crabtree Lane, Jerry Shaw's North Shore windmill, and Rawsthorne's at Clayton Street, but could get no flour; neither could any one else, and they were almost stranded. One Saturday night or rather Sunday morning my father, after a long day (Saturdays were Saturdays in bread shops in those days), had gone to rest, when a fresh wind sprang up. Tired as he was he hurried off at once to Rawsthorne's mill, not many yards away, intent on persuading old Richard to start his mill if possible. There were penalties for running a mill on Sunday, but these had to be risked. Early as he was, John Blanchard, whose

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THE TOWER MILL.

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Long Buckley, Hampshire.

the past, and of the great distance the milling art has since traversed towards perfection. Others of the old towers have been preserved for far different purposes than those for which they were erected. The conservators of Wimbledon Common (like the purchasers of Orient Mill, Long Island, U.S.A.), retain near the golf links on the common an old tower solely as a picturesque adjunct to the landscape; its sail gear still being kept in order, and at times turning in the wind as briskly as though grinding grain in-

shop was in Devon Street, considerably further from the mill than my father's, was already there and had roused Rawsthorne. Blanchard had wheat in the mill also, and claimed a prior right of grinding, his having been delivered before my father's; but after a palaver the miller agreed to start and the two bakers agreed to shoot sack and sack of their wheat alternately into the mill, and take off sack and sack of the flour; agreeing also to pay Rawsthorne's fine in case he should be penalised. The mill ground grandly, and though close by St. John's and Christ Churches, was kept at it all the Sunday through; the result being that on Monday Lunt and Blanchard had flour to sell while others had none, and cleared it out as fast as it arrived from the mill. Fortunately the authorities under the circumstances overlooked the offence, and nothing further was ever heard of it."

Wimbledon Common.

stead of gyrating uselessly in the air. At Dumfries one has been used since 1834 as an observatory; at Ramsey, Isle of Man, another is converted into a dwelling house; and at Ryegate Heath is one which, transformed into a place of worship in September 1880, has long been known as the Chapel of St. Cross. Here, in connection with the Parish Church, a full choral service is held every Sunday; all indication of the original purpose of the tower being lost in the artistic fittings and decorations, which impart to the place the perfect semblance of a well-built ecclesiastical edifice.

The vicinity of a mill may have often been desired as a place of burial; but so far as we know there was but one miller who, entertaining such a desire, had it realised—John Oliver of Highdown Hill, Sussex, who, in 1766, he being then fifty-seven years of age, prepared his tomb beside his mill on the hill, and erected a summer house beside it, where in quiet hours he sat in meditation. For seven and twenty years he thus alternately tended the mill and the grave, till in 1793, when he ceased his labours, he was obediently carried from the one to the other; and, according to his last will, a girl, amid a vast concourse of spectators, read the service for the dead

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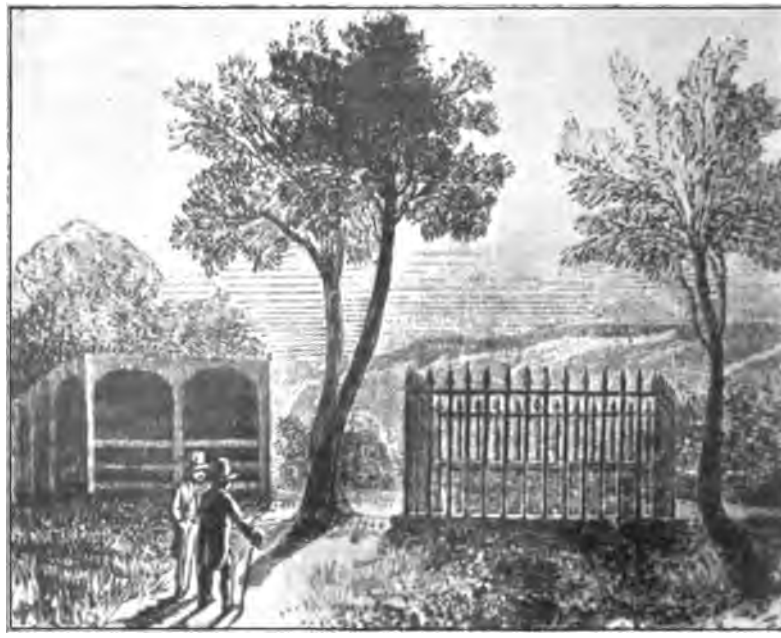
and preached a homily from Micah vii. 5, 9: "Trust ye not in a friend, put ye not confidence in a guide: keep the doors of thy mouth from her that lieth in thy bosom: rejoice not against me, O mine enemy, when I fall, I shall arise"—indicative no doubt of some sad experience of the lonely old miller. Upon one side of the tomb he had had inscribed, "For the reception of John Oliver when deceased to the will of God: granted by William Westbrook Richardson, Esq, 1766," to which was added upon a panel overlooking a lovely prospect of land and sea, "In memory of John Oliver, miller, who departed this life the 22nd



The Tomb by the Mill.

of April, 1793, aged eighty-four years." He left by will £20 a year for the tending of the tomb and the summer house, but of their ultimate fate we have no knowledge.

CHAPTER XXI.

"WHO OWNS THE WIND?"

XXI. "WHO OWNS THE WIND?"

1. Feudal Monopoly.

1. UNDER the feudal laws no one without special grant or concession was permitted to erect mills, including of course windmills, and hence without such permission could not use the wind for milling purposes. Thus those who could so use it did, in a sense, collectively "own" the wind for that particular purpose. When the operation of these ancient laws first began to be popularly realised, resentment at such a monopoly was commonly expressed in the sarcastic problem—"The air is free to all and the wind is but the air: Who shall own it?" As a matter of fact the query was invariably answered by the law in favour of the privileged mills, to the prejudice of which no one was permitted to use the wind for mill driving. It was owing to failure to perceive this legal fact that in 1391 a Bishop of Utrecht placed himself in a very awkward and illegal position regarding windmilling. The monks of Zwoll desiring to erect for their house a windmill on ground which did not belong to them, were prevented so doing by the lord of the soil, who, of course, held the sole milling rights of the estate. The clerics appealing thereupon to the bishop, the angry prelate declared that in his diocese no one should have control of the wind but himself; and signed letters-patent to the monks to erect their mill wherever they pleased; but if they did erect the mill, there is no doubt the lord of the manor duly evoked the power of the law to protect his rights.

Chron. Can. Ord. Ang. Buschio: 1621, 73.

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The entire merits of such a case are aptly summarised in the feudal customs of Berry, France—"Any one may construct or erect a windmill on his heritage, provided that it is not within the territory and jurisdiction of a lord possessing manorial milling soke rights: Chacun peut en son héritage édifier ou construire moulin à vent pourvu que ce ne soit dedans le terroir et justice d'aucun seigneur ayant droit de moulin bannier (*tit.* xvi. *art.* i.). This was the feudal law prevailing generally throughout Europe, in virtue of which the owner of a windmill possessed the right of usage of all wind necessary to drive his mill, and, like Abbot Samson of Bury St. Edmunds in 1191, was *de facto* constituted "owner of the wind."

1. Feudal Monopoly.

2. Modern Freedom.

2. At the extinction of milling soke, all claim to monopoly of grinding, and hence to monopoly of wind, vanished, unless by special enactment the monopoly were continued. In various Acts of Parliament of about a century ago relating to windmills, special clauses are inserted protecting them from any interference with their aerial motive-power by the erection of buildings or the planting of trees in their vicinity. Such a clause was inserted in the Act for the enclosure of Wavertree Common lands, near Liverpool, whereon stood a soke mill that had for centuries enjoyed by prescription the uninterrupted use of the wind:—"If any person or persons shall erect or build any house or building, or shall plant any tree or trees within the distance of two hundred yards from a certain windmill situate on the common, or shall suffer any tree or trees planted without the distance aforesaid to grow to such a height as to prevent the going of the said windmill, the same shall be and is hereby declared a nuisance, and shall and may be removed or prevented by the said lord of the manor or the owner or occupier of the said windmill." Still, a belief in the ownership of the wind occasion-

Wavertrée Enc. Act, 8 Geo. III. sec. 23.

XXI. "WHO OWNS THE WIND?"

2. Modern Freedom.

ally lingered in the minds of modern millers, and an interesting case in point occurs.

This was a suit (a brief abstract only of which can be given) heard in the Common Pleas, April 26, 1861. The plaintiff, who possessed since 1856 a windmill built in 1829, at Emmeth, claimed a right to enjoy the benefit of the currents of air from the west unto the said mill. He had enjoyed this right till the defendants, in 1859, had built a school-house, only twenty-five yards from the mill, which impeded all air currents from the west reaching the mill, the value of which had accordingly deteriorated by the sum of £300 claimed. An injunction was sought to restrain the defendants from continuing the injury. At Norwich Assizes in 1860 a verdict by consent had been entered for plaintiff, with damages assessed at 40s., subject to the award of an arbitrator on certain points; and the arbitrator had found that the plaintiff had sustained injury, but left for the decision of the Court the question whether he was entitled to a right to the air currents. It was now argued on behalf of the plaintiff that little direct authority was to be found upon the subject in the books. Two cases, however, were reported in Gale on *Easements* (2nd edit. 197, 198), which went far to establish plaintiff's claim. The first was an anonymous case in Winch's *Reports*, wherein Winch stated that it had been adjudged in the Court of Common Pleas that where one had erected near the windmills in Finsbury Fields, London, a house so high that the wind was stopped from them, such house should be broken down. The other case was in Rolle's *Abridgement*, in an action for a nuisance brought against one who built a house to the injury of another's mill, inasmuch as the wind was prevented from reaching the mill, so that it could not grind; and the jury found that the defendant had erected a new structure, two yards of

Law Rpts. 10 C. & B. NS. 268. 30 L. J. C. P. 384. 9 W. R. 899.

XXI. "WHO OWNS THE WIND?"

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the top of which hindered the mill; which two yards constituted a nuisance, and should be removed. However, no award is stated to have been actually made, the Court being divided in opinion as to whether the two yard portion should be removed, or the whole house should be pulled down.* Chief-Justice Earle now said this was a case of novelty so far as decisions went; but upon the whole he was of opinion that the defendants were entitled to succeed. There were three ways in which the millowners could have acquired the right claimed—by prescription, by grant, or by statute. In this case, as the mill was erected within living memory, the plaintiff could not claim by prescription, and it was clear there had been no grant. The plaintiff could therefore only rely on the statute of 2 & 3 William IV. c. 71, referring to easements, and this could not be held to apply to the case.

In giving a decision accordingly the judge remarked, "Suppose an individual to be the owner of all the land round a mill beyond a radius of twenty or twenty-five yards, must he, in order to prevent the acquisition of a right to the currents of air by the owner of the mill, build a wall all round it?" Though no reply is reported to the curious question, it appears clear that, if the mill were an ancient manorial one, it would be possessed of its ancient prescriptive right to the wind, of which no new owner of the surrounding land had any right to deprive it; while if it were a modern one, it would have no such right.

Repts., 13 C. & B., NS. 841. 31 L. J. C. P., 335. 8 Jur. NS. 621.

The case was heard on appeal in the Exchequer Court in 1863. The Court decided that the two cases that had been urged in plaintiff's favour amounted to little more than dicta, while it did not

* This is stated to be known as Traherne's case, heard in 11 Jas. I. 1614. Another case mentioned is that of Godman *v.* Gore, the plaintiff claiming damages for the erection of houses eighty feet from his mill, and reaching above the top of the same: but "notwithstanding this neernesse the Court directed the jury to find for the defendant."

appear they were anywhere else reported, or in what manner the right claimed had been obtained. In Traherne's case the judgment was for throwing down so much of the house as hindered the mill; but the plaintiff claiming to have the whole house pulled down, caused the case to be adjourned, and no ultimate decision seems to have been given. These were stated to be all the authorities the Court had been able to find on the subject; and the judgment of the Court below, negativing the miller's claim, was confirmed.

Contrasting with fruitless litigation of this character is the well-advised course adopted by a Sussex mill-owner who, in 1853, found his new mill shut off from the wind by the erection of a new county gaol at Lewes. The owner, wisely recognising that he had no ancient prescriptive right to prevent the gaol authorities or any one else screening off the wind, promptly raised his mill thirty feet higher, so reaching currents of air passing over the gaol; Mr. C. Wells of Lewes, who informs us of the circumstance, stating that the tower was raised by screw jacks, and a lower storey of brick gradually built beneath it. Such a solution of a difficulty of the kind does not appear to have occurred to the judges in the Emmeth case: though it is obvious that a miller may rear his mill to any height he pleases in order to secure free air, precisely as the well-sinker, in order to obtain water, may bore to any depth he pleases, no matter how many shallower wells may be in the neighbourhood. It was, of course, in accordance with this legal right that in modern times windmills were built to the great height, towering above all adjacent buildings, so commonly witnessed especially in or near towns.

CHAPTER XXII.

THE HORIZONTAL WINDMILL.

XXII. HORIZONTAL WINDMILL.

UNLIKE horizontal watermills, which themselves were the pioneers in watermilling, horizontal windmills are a modern variation from the original model. A variety of opinions have been entertained during the last century and a half relative to the advantages of horizontal windmills, but the general view of practical millers has been adverse to them. The sailbeam is fitted in a vertical position revolving on a pivot; the four horizontal cross-bars affixed to it carrying as many sails. While the sails of an ordinary vertical windmill all remain exposed to the air as they revolve, those of a horizontal windmill, on the contrary, must be partly screened. In one form, a semicircular shield encompasses one-half of the mill, allowing two arms to be exposed to the wind and driven round, but sheltering the other two whilst returning; and in order to enable the sails to be trimmed to the wind from any direction the shield is moveable round the mill, so as always to shelter the returning sails under its lee. Sometimes, in lieu of providing a shield, the plan known as that of Beatson is adopted: the returning sails being made to turn so as to present their edges only to the wind; a variation upon this again being found in the expedient of bringing the frames, upon which the sails are stretched, to the yard, so that they are blown out or opened when the wind bears upon them, but closed when returning against it. In another variety, the

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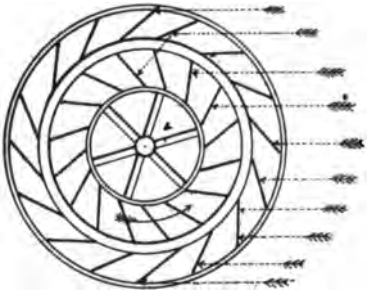
sails revolve in a fixed position from whatever direction the wind may blow. In 1767 a French machinist, named Bourrier, proposed such a contrivance to the Academy des Sciences; the council receiving the idea favourably, but finally rejecting it as impracticable on the ground that the sails, being of great length, would be bent by their own weight.

Hist. Vie Pr. Fr. D'Aussy, I. 66.

But a considerably more compact and ingenious device than any of the foregoing serves its purpose perfectly. The wheel, mounted on a vertical axis, and having flat vanes fitted round its circumference, is enclosed in a circular casing, which is fitted with boards fixed obliquely, or in such lines as if produced inwards would touch the circumference of the windwheel. By this arrangement, from whatever point the wind may blow it will cause the wheel to revolve in the same direction. Part of the breeze passes between the oblique ports of the casing and acts on the plates of the wheel; while part is intercepted by the plates, and either reflected inwards so as to propel the plates in the same direction, or reflected outwards so as not to act upon them in the opposite direction. Smeaton considered the available power of a horizontal mill to be one-eighth or one-tenth that of an ordinary windmill; Ferguson says, however, he formed too low an estimate, which is more correctly estimated at one-fifth of that of the ordinary windmill. In the early part of the present century premiums were offered by the Society of Arts for "the best methods of constructing horizontal windmills"; but the type has never been adopted by corn-millers to any appreciable extent.



Horizontal Windmill.

Spon's Dict. of Engineering, 1873 : 2476.

Edin. Ency. Vol. XIII.

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